

## **Appendices**

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<b>Appendix 1</b>  <b>Environment</b>	Please indicate on a scale of 1-5 how you rate the question item (1 being weak and 5 being strong) and provide any comments you may have in the box provided next to the item
1. Global climate change will be a major problem for future generations unless the construction industry adopts sustainable practices 2.	
3. We cannot slow the rate of climate change 4.	
5. Factoring waste into the design of buildings is important for reducing unnecessary use of natural resources 6.	
7. All materials * in construction processes(development?) should be sourced locally 8.	
9. Only sustainable materials should be used in building development 10.	
11. Refurbishment of existing buildings should be always considered before new build is undertaken	
12. The construction industry has an extremely important role to play in the protection of the environment	
13. The construction industry is depleting the worlds natural resources at an unsustainable rate	
14. The impact the construction industry has on the environment has been exaggerated	
15. The ultimate solution to environmental problems depends on drastic changes in the way the construction industry operates	
16. If the construction industry continues to consume more energy and materials than can be reproduced and emit more emissions that can be absorbed the industrial system will become ecologically unsustainable	
17. Environment and climate change are relatively low priorities in the construction industry	
18. Solutions to environmental problems are strongly correlated with increasing environmental awareness and environmental education	
19. Technological advances in the construction industry means that we can continue to use natural resources as one will balance out the other on an environmental level	
20. Modern science and technological advancements will solve our environmental problems	
21. Modern science and technological advancements will NOT solve our environmental problems	
22. We cannot keep counting on science and technology to solve our environmental problems	
23. Environmental problems have always existed and been solved so there is no need to worry about sustainable development	

24. The construction industry should use renewable energy and recycled materials when they are readily available	
25. The benefits of a built environment are more important than the pollution that results from production and use	
<b>Social</b>	
1. The reduction of worldwide poverty is important for sustainable development	
2. Sustainable development will contribute to the reduction of poverty	
3. The built environment has a vital role in the reduction of poverty	
4. More emphasis should be placed on reducing poverty when considering sustainable development	
5. Protecting peoples' jobs is more important than protecting the environment	
6. Protecting the environment is more important than protecting peoples' jobs	
7. Implementing sustainable practices such as retrofitting will provide more job opportunities	
8. Sustainable development is important for the creation of more jobs for people	
9. The construction industry should do more to minimise noise water and spatial pollution for communities	
10. Environmental degradation from construction activities has a negative impact on the health of individuals	
11. Preserving nature is important because of what it can contribute to the pleasure and welfare of humans	
12. Human well being cannot be sustained without a healthy environment	
13. Degradation of the environment through construction activities means that people in poor countries are unable to provide for themselves	
14. Communities can benefit from sustainable development	
15. Involving communities in sustainable development can promote sustainability	
16. Sustainable development is as much about the children in the future as it is about what we need today	
17. Education for sustainable development emphasizes respect for human rights	

18. Every girl or boy should receive education that teaches the knowledge, perspectives, values, issues and skills for sustainable living in a community	
19. Using more resources than we need is a serious threat to the health and welfare of future generations	
<b>Economic</b>	
1. The benefits of implementing sustainable practices in the construction industry do not outweigh the economic costs	
2. The costs of implementing sustainable practices far outweigh the benefits	
3. The construction industry is too significant a source of financial investment to take risks on implementing sustainable practices	
4. Unless costs savings can be evidence and achieved businesses will not adopt sustainable practices	
5. Adoption of sustainable practices can lead to costs savings and greater profits	
6. The construction industry can still make a profit whilst adopting sustainable practices	
7. Implementing sustainable practices is too risky from a costs perspective	
8. It is all right for humans to use nature as a resource for economic purposes	
9. Humans do NOT have the right to damage the environment just to get greater economic growth	
10. We should no longer use nature as a resource for economic purposes	
11. The question of the environment is secondary to economic growth	
12. It is easier and more cost effective to adopt practise that can be seen as unsustainable	
13. Adopting sustainable practices is only worthwhile if it reduces costs/increases profits	
14. Protection of the environment is more important that economic growth	
15. Companies that are environmentally sustainable are more likely to be profitable over the long run	
<b>Other (Policy, Legislation, Education)</b>	
1. Reporting sustainability business plans and achievements will lead to companies gaining a competitive edge in the market	
2. The Government should be leaders in sustainability and the environment	

3. The Government should bear sole responsibility for environmental protection/sustainability	
4. Governments should control the rate at which raw materials are used to ensure that they last as long as possible	
5. The Government should provide stronger guidelines on sustainable development and associated practices	
6. Better planning and management of projects would lead to more sustainable practice	
7. Sustainable design should always include reuse and recycling	
8. The reuse and recycling of materials in buildings can contribute significantly an environmental, economic and social level	
9. Solutions to environmental problems are strongly correlated with increasing environmental awareness and environmental education	
10. Laws regarding water usage should be stricter	
11. Industries should be held financially responsible for any pollution they cause	
12. Corporate social responsibility is irrelevant to sustainable development	
13. Sustainable development does not require *that businesses *to behave responsibly	
14. The construction industry is of vital important to sustainable development	
15. We need stricter laws and regulations to protect the environment.	
16. Sustainability is impossible to achieve so we should just carry on with normal practice	
17. Responsibility for implementing sustainable practices in industry lies with everyone	

## **Appendix 2**

Dear Sir/Madam,

I am one of Alison Cotgrave's PhD students. I am conducting a questionnaire survey to test the reliability of a measure I have developed along with testing whether there are any associations between the measure and psychological constructs.

I ask that I may attend your class/lecture in order to disseminate my questionnaire amongst your students. The students will be required to complete 3 questionnaires in total. The process should take around 15-20 minutes.

I thank you in anticipation of your kind assistance.

Kind regards,

Michelle Brennan

## Appendix 3



### INFORMATION SHEET FOR PARTICIPANTS

#### **Name of Researcher and School/Faculty**

Michelle Brennan, School of the Built Environment, LJMU

You are being invited to take part in a PhD research study. Before you decide it is important that you understand why the research is being done and what it involves. Please take time to read the following information. If there is anything that is not clear or if you would like more information please ask. Take time to decide if you want to take part or not.

#### **1. What is the research study about?**

The aim of this study is to ascertain attitudes towards sustainable development within the built environment.

#### **2. Do I have to take part?**

Participation in the study is completely voluntary and you are not obliged to take part. If you do take part you will be asked to provide consent. You may withdraw from the study at any time you wish and you do not have to provide a reason.

#### **3. What will happen to me if I take part?**

You will be asked to complete some questionnaires, one pertaining to attitudes and one pertaining to emotional self-efficacy. Completion of the same should take no more than 15 minutes. You will also be asked to provide some demographic information including your age, gender, course and level of study.

#### **4. What are the possible disadvantages and risks involved, if any?**

There are no disadvantages or risks in taking part.

#### **5. What are the possible benefits of taking part?**

The outcomes of this study may help to inform sustainability literacy education at both higher education and professional level thus providing for better teaching delivery of such issues. The increasing focus around sustainability issues by both government and industry may mean that those better informed of the same will be at advantage in both the jobs market and client market. Results of your answers and feedback on the same can be provided upon request should you be interested.

#### **6. Will my taking part in this study be kept confidential?**

All information provided will be kept strictly confidential. You do not have to provide your name on any of the questionnaires and your signature on the consent form can be just your initials if you wish. Signed consent forms will be kept separate from any information you provide. All information will be securely held by the researcher. Any information provided, data collected and electronic recordings will be securely stored and will be destroyed by shredding or electronic deletion after a minimum of 4 years of completing the study.

#### **7. What will happen to the results of the research study?**

The results of the research will be used for a PhD dissertation, which may be published in an academic journal. You will **not** be identified in any report or publication.

#### **8. Has this study been approved by an ethics committee?**

This study has gained ethical approval from the Liverpool John Moores Research Ethics Committee (REC).

#### **9. Who should I contact with enquiries about this study?**

Any questions that you have about your participation, withdrawal, role in the study or in general, should be addressed to Michelle Brennan, the principal researcher **and/or Dr Alison Cotgrave, Principal Supervisor.**

Michelle Brennan, School of The Built Environment, Liverpool John Moores University, Henry Cotton Building, 15-21 Webster Street, L3 2ET [M.Brennan@ljmu.ac.uk](mailto:M.Brennan@ljmu.ac.uk)

Dr Alison Cotgrave, Deputy Director of School of The Built Environment, Liverpool John Moores University, [A.J.Cotgrave@ljmu.ac.uk](mailto:A.J.Cotgrave@ljmu.ac.uk)





### Sustainable Development Attitudes Measure

The statements below relate to sustainability within the built environment (which includes everything in your surroundings that are man-made such as buildings, houses, roads, parks etc.). Please read each statement carefully and indicate to what extent you agree or disagree by circling the number that best represents your attitude toward that statement. **If possible please AVOID using ‘Neither Agree nor Disagree’ as your answer. If you are leaning more towards one end of the scale please choose this answer. There are no right or wrong answers. Your knowledge is not being tested.**

- Response Options**
- 1: Strongly Disagree
  - 2: Disagree
  - 3: Neither Agree nor Disagree
  - 4: Agree
  - 5: Strongly Agree

1. Global climate change will be a major problem for future generations unless the construction industry adopts sustainable practices	1	2	3	4	5
2. Companies that are environmentally sustainable are more likely to be profitable over the long run	1	2	3	4	5
3. Corporate social responsibility is irrelevant to sustainable development	1	2	3	4	5
4. Materials in construction development should always be sourced locally	1	2	3	4	5
5. Sustainable development can contribute to the reduction of poverty	1	2	3	4	5
6. It is all right for humans to use nature as a resource for economic purposes	1	2	3	4	5
7. Better planning and management of projects would lead to more sustainable practice	1	2	3	4	5
8. Using more resources than we need for the built environment is a serious threat to the health and welfare of future generations	1	2	3	4	5
9. Sustainable development is as much about the children in the future as it is about what we need today	1	2	3	4	5
10. Unless costs savings can be evidenced and achieved, the construction industry will not adopt sustainable practices	1	2	3	4	5
11. The Government should be leaders in sustainability and the environment	1	2	3	4	5
12. Modern science and technological advancements will solve our environmental problems	1	2	3	4	5
13. Involving communities in sustainable development can promote sustainability	1	2	3	4	5

14. Protection of the environment is more important than economic growth	1	2	3	4	5
15. Sustainable development does not require businesses to behave responsibly	1	2	3	4	5
16. Refurbishment of existing buildings should always be considered before new build is undertaken	1	2	3	4	5
17. Communities can significantly benefit from sustainable development	1	2	3	4	5
18. Implementing sustainable practices in the construction industry is too risky from a costs perspective	1	2	3	4	5
19. The Government should provide stronger guidelines on sustainable development and associated practices	1	2	3	4	5
20. The construction industry has an extremely important role to play in the protection of the environment	1	2	3	4	5
21. Humans do not have the right to damage the environment in order to get greater economic growth	1	2	3	4	5
22. Solutions to environmental problems are strongly correlated with increasing environmental awareness and environmental education	1	2	3	4	5
23. Modern science and technological advancements will not solve our environmental problems	1	2	3	4	5
24. The impact the construction industry has on the environment has been exaggerated	1	2	3	4	5
25. Sustainable development should create and provide jobs at a local level	1	2	3	4	5
26. Reporting sustainability business plans and achievements will lead to companies gaining a competitive edge in the market	1	2	3	4	5
27. The construction industry is of vital importance to sustainable development	1	2	3	4	5
28. Sustainability is impossible to achieve so the construction industry should just carry on with normal practice	1	2	3	4	5

### **Emotional Self-Efficacy Scale (ESES)**

Using the rating scale below please read each statement and rate your confidence in performing each function/how confident you are that you can perform each function.

**1 = Not at all confident 2 = Somewhat unconfident 3 = Neither confident nor unconfident 4 = Somewhat confident 5 = Very confident**

<b>Number</b>	<b>Statement</b>	<b>Response</b>
1	Understand what causes your emotions to change	
2	Correctly identify your own positive emotions	
3	Know what causes you to feel a negative emotion	
4	Realize what causes another person to feel a negative emotion	
5	Realize what causes another person to feel a positive emotion	
6	Correctly identify when another person is feeling a positive emotion	
7	Figure out what causes another person's differing emotions	
8	Use positive emotions to generate good ideas	
9	Recognize what emotion is being communicated through your facial expression	
10	Notice the emotion your body language is portraying	
11	Generate the right emotion so that creative ideas can unfold	
12	Notice the emotion another person's body language is portraying	
13	Change your negative emotion to a positive emotion	
14	Figure out what causes you to feel differing emotions	
15	Understand what causes another person's emotions to change	
16	Help another person to regulate emotions when under pressure	
17	Correctly identify your own negative emotions	
18	Know what causes you to feel a positive emotion	
19	Help another person calm down when he or she is feeling angry	

20	Correctly identify when another person is feeling a negative emotion	
21	Get into a mood that best suits the occasion	
22	Create emotions to enhance cognitive performance	
23	Regulate your own emotions when close to reaching a goal	
24	Create a positive emotion when feeling a negative emotion	
25	Use positive emotions to generate novel solutions to old problems	
26	Recognize what emotion another person is communicating through his or her facial expression	
27	Create emotions to enhance physical performance	
28	Help another person change a negative emotion to a positive emotion	
29	Calm down when feeling angry	
30	Regulate your own emotions when under pressure	
31	Help another person regulate emotions after he or she has suffered a loss	
32	Generate in yourself the emotion another person is feeling	

**IMPORTANT – PLEASE PROVIDE DEMOGRAPHIC INFORMATION**

Age/Gender	
Course (e.g. Building Surveying/Construction Management)	
Part time/Full time	
Do you currently work in industry? If so state occupation	
Do any of your modules contain a sustainability component?	YES          NO

**Thank you for taking the time to complete the questionnaires. Your assistance is much appreciated.**

## Appendix 4

Dear NAME

I am one of Alison Cotgrave's PhD students at LJMU. I have been provided with your name as a point of contact in the hope that you may be able to assist me in my research. It would require you to take 10-15 minutes at the beginning of one of your lectures/seminars to distribute 2 questionnaires details of which I set out below.

I have developed a questionnaire pertaining to sustainable development in a construction context and have piloted the same at JMU with built environment students. I have also given them a psychological measure to assess whether emotional self-efficacy is correlated with such attitudes. The results of the pilot were very promising with high reliabilities for the measure I developed and the correlations with the emotional self-efficacy scale were statistically significant. I am looking to further validate my measure and obtain a more robust data set for my research by generalising the results to a wider population of built environment students across the UK. This includes all built environment and architect students.

The results of this research could be important for training industry professionals and students in both sustainability and emotional intelligence which is known to link with leadership skills and also educational success.

I will send hard copies in the post with pre-paid return envelopes as conducting electronically doesn't seem to generate a good response rate. I approached 230 students directly at JMU and got 226 usable questionnaires back for my pilot. I appreciate this is a busy time of year and thank you for any assistance you can provide.

I look forward to hearing from you,

Kind regards,  
Michelle Brennan  
PhD Research Student  
Built Environment LJMU

## Appendix 5



### INFORMATION SHEET FOR PARTICIPANTS

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9. Sustainable development is as much about the children in the future as it is about what we need today	1	2	3	4	5
10. Unless costs savings can be evidenced and achieved, the construction industry will not adopt sustainable practices	1	2	3	4	5
11. The Government should be leaders in sustainability and the environment	1	2	3	4	5
12. Modern science and technological advancements will solve our environmental problems	1	2	3	4	5



13. Involving communities in sustainable development can promote sustainability	1	2	3	4	5
14. Protection of the environment is more important than economic growth	1	2	3	4	5
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<b>27.</b> The construction industry is of vital importance to sustainable development	1	2	3	4	5
28. Sustainability is impossible to achieve so the construction industry should just carry on with normal practice	1	2	3	4	5

### **Emotional Self-Efficacy Scale (ESES)**

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<b>Number</b>	<b>Statement</b>	<b>Response</b>
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16	Help another person to regulate emotions when under pressure	
17	Correctly identify your own negative emotions	
18	Know what causes you to feel a positive emotion	
19	Help another person calm down when he or she is feeling angry	
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21	Get into a mood that best suits the occasion	

22	Create emotions to enhance cognitive performance	
23	Regulate your own emotions when close to reaching a goal	
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29	Calm down when feeling angry	
30	Regulate your own emotions when under pressure	
31	Help another person regulate emotions after he or she has suffered a loss	
32	Generate in yourself the emotion another person is feeling	

**IMPORTANT – PLEASE PROVIDE DEMOGRAPHIC INFORMATION**

Age	
Gender	Male                  Female
Occupation/Position	
Level of Education	
Year of Graduation	Undergraduate          Post Graduate
Length of time in Industry	

**Thank you for taking the time to complete the questionnaires. Your assistance is much appreciated.**

## Appendix 6

### Statistics

Gender of Student

N	Valid	207
	Missing	19

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age of Student	170	18	48	23.09	5.681
Valid N (listwise)	170				

### Gender of Student

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	178	78.8	86.0	86.0
	Female	29	12.8	14.0	100.0
	Total	207	91.6	100.0	
Missing	System	19	8.4		
Total		226	100.0		

## Correlations SDAM and subscales

### Correlations

		SDAM Total	Environmental Subscale Total	Social Subscale Total	Economic Subscale Total	Other Items Total
SDAM Total	Pearson	1	.739**	.862**	.743**	.845**
	Correlation					
	Sig. (1-tailed)		.000	.000	.000	.000
	N	226	226	226	226	226
Environmental Subscale Total	Pearson	.739**	1	.543**	.372**	.454**
	Correlation					
	Sig. (1-tailed)	.000		.000	.000	.000
	N	226	226	226	226	226
Social Subscale Total	Pearson	.862**	.543**	1	.516**	.675**
	Correlation					
	Sig. (1-tailed)	.000	.000		.000	.000
	N	226	226	226	226	226
Economic Subscale Total	Pearson	.743**	.372**	.516**	1	.530**
	Correlation					
	Sig. (1-tailed)	.000	.000	.000		.000

	N	226	226	226	226	226
Other Items Total	Pearson	.845**	.454**	.675**	.530**	1
	Correlation					
	Sig. (1-tailed)	.000	.000	.000	.000	
	N	226	226	226	226	226

\*\* . Correlation is significant at the 0.01 level (1-tailed).

## Reliability SDAM

### Case Processing Summary

		N	%
Cases	Valid	226	100.0
	Excluded <sup>a</sup>	0	.0
	Total	226	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.866	28

### Item Statistics

	Mean	Std. Deviation	N
SDAM Item 1	4.01	1.022	226
SDAM Item 2	3.53	1.029	226
SDAM Item 3	3.66	1.025	226
SDAM Item 4	2.95	1.136	226
SDAM Item 5	3.14	1.077	226
SDAM Item 6	2.70	1.027	226
SDAM Item 7	4.21	.884	226
SDAM Item 8	3.88	1.136	226
SDAM Item 9	4.00	1.062	226
SDAM Item 10	3.60	1.088	226
SDAM Item 11	4.06	1.102	226
SDAM Item 12	3.31	1.131	226
SDAM Item 13	3.98	.894	226
SDAM Item 14	3.27	1.166	226

SDAM Item 15	3.76	1.027	226
SDAM Item 16	3.84	1.035	226
SDAM Item 17	4.02	.871	226
SDAM Item 18	3.46	1.029	226
SDAM Item 19	3.91	.882	226
SDAM Item 20	4.19	.954	226
SDAM Item 21	3.51	1.255	226
SDAM Item 22	3.88	.918	226
SDAM Item 23	3.40	1.128	226
SDAM Item 24	3.30	1.110	226
SDAM Item 25	3.71	.910	226
SDAM item 26	3.66	.925	226
SDAM Item 27	4.10	.848	226
SDAM Item 28	4.05	1.153	226

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SDAM Item 1	99.09	165.992	.553	.857
SDAM Item 2	99.57	169.846	.398	.862
SDAM Item 3	99.44	168.283	.461	.860
SDAM Item 4	100.15	176.457	.127	.870
SDAM Item 5	99.96	174.950	.193	.867
SDAM Item 6	100.40	179.761	.028	.871
SDAM Item 7	98.89	168.028	.558	.858
SDAM Item 8	99.23	165.607	.502	.859
SDAM Item 9	99.10	165.612	.543	.858
SDAM Item 10	99.50	176.251	.144	.869
SDAM Item 11	99.04	165.532	.524	.858
SDAM Item 12	99.80	176.678	.121	.870
SDAM Item 13	99.12	167.208	.587	.857
SDAM Item 14	99.84	170.733	.312	.864
SDAM Item 15	99.34	170.368	.380	.862
SDAM Item 16	99.27	168.943	.430	.861
SDAM Item 17	99.08	166.589	.633	.856
SDAM Item 18	99.64	169.520	.411	.861
SDAM Item 19	99.19	168.460	.540	.858
SDAM Item 20	98.91	164.632	.656	.855
SDAM Item 21	99.59	167.363	.390	.862
SDAM Item 22	99.22	167.613	.552	.858
SDAM Item 23	99.70	176.087	.141	.869

SDAM Item 24	99.81	168.646	.406	.861
SDAM Item 25	99.39	170.310	.440	.861
SDAM item 26	99.44	168.896	.493	.859
SDAM Item 27	99.00	167.613	.604	.857
SDAM Item 28	99.05	165.451	.499	.859

#### Scale Statistics

Mean	Variance	Std. Deviation	N of Items
103.10	181.594	13.476	28

### Reliability Environmental Subscale

#### Case Processing Summary

		N	%
Cases	Valid	226	100.0
	Excluded <sup>a</sup>	0	.0
	Total	226	100.0

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

Cronbach's Alpha	N of Items
.608	7

#### Item Statistics

	Mean	Std. Deviation	N
SDAM Item 1	4.01	1.022	226
SDAM Item 4	2.95	1.136	226
SDAM Item 12	3.31	1.131	226
SDAM Item 16	3.84	1.035	226
SDAM Item 20	4.19	.954	226
SDAM Item 23	3.40	1.128	226
SDAM Item 24	3.30	1.110	226

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SDAM Item 1	20.98	12.711	.432	.534
SDAM Item 4	22.04	14.016	.188	.617
SDAM Item 12	21.69	13.237	.290	.582
SDAM Item 16	21.16	13.263	.341	.564
SDAM Item 20	20.81	13.491	.357	.560
SDAM Item 23	21.59	12.660	.370	.553
SDAM Item 24	21.70	13.234	.302	.577

**Scale Statistics**

Mean	Variance	Std. Deviation	N of Items
25.00	16.902	4.111	7

**Reliability Economic Subscale**

**Case Processing Summary**

		N	%
Cases	Valid	226	100.0
	Excluded <sup>a</sup>	0	.0
	Total	226	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	N of Items
.522	7

**Item Statistics**

	Mean	Std. Deviation	N
SDAM Item 2	3.53	1.029	226



SDAM Item 6	2.70	1.027	226
SDAM Item 10	3.60	1.088	226
SDAM Item 14	3.27	1.166	226
SDAM Item 18	3.46	1.029	226
SDAM Item 21	3.51	1.255	226
SDAM item 26	3.66	.925	226

#### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SDAM Item 2	20.21	11.374	.333	.452
SDAM Item 6	21.04	12.745	.129	.532
SDAM Item 10	20.14	14.048	-.060	.605
SDAM Item 14	20.47	10.482	.384	.423
SDAM Item 18	20.28	11.358	.336	.451
SDAM Item 21	20.23	9.624	.455	.381
SDAM item 26	20.08	12.239	.255	.485

#### Scale Statistics

Mean	Variance	Std. Deviation	N of Items
23.74	14.745	3.840	7

## Reliability Social Subscale

#### Case Processing Summary

		N	%
Cases	Valid	226	100.0
	Excluded <sup>a</sup>	0	.0
	Total	226	100.0

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

Cronbach's Alpha	N of Items
.739	7

**Item Statistics**

	Mean	Std. Deviation	N
SDAM Item 5	3.14	1.077	226
SDAM Item 8	3.88	1.136	226
SDAM Item 9	4.00	1.062	226
SDAM Item 13	3.98	.894	226
SDAM Item 17	4.02	.871	226
SDAM Item 22	3.88	.918	226
SDAM Item 25	3.71	.910	226

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SDAM Item 5	23.47	15.433	.236	.761
SDAM Item 8	22.73	13.680	.430	.716
SDAM Item 9	22.61	14.257	.399	.722
SDAM Item 13	22.63	14.012	.564	.685
SDAM Item 17	22.59	13.781	.625	.673
SDAM Item 22	22.73	13.887	.563	.684
SDAM Item 25	22.90	14.687	.440	.711

**Scale Statistics**

Mean	Variance	Std. Deviation	N of Items
26.61	18.585	4.311	7

**Reliability Other Subscale**

**Case Processing Summary**

		N	%
Cases	Valid	226	100.0
	Excluded <sup>a</sup>	0	.0
	Total	226	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	N of Items
.783	7

**Item Statistics**

	Mean	Std. Deviation	N
SDAM Item 3	3.66	1.025	226
SDAM Item 7	4.21	.884	226
SDAM Item 11	4.06	1.102	226
SDAM Item 15	3.76	1.027	226
SDAM Item 19	3.91	.882	226
SDAM Item 27	4.10	.848	226
SDAM Item 28	4.05	1.153	226

**Item-Total Statistics**

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SDAM Item 3	24.09	15.605	.542	.748
SDAM Item 7	23.54	16.640	.503	.757
SDAM Item 11	23.69	15.244	.533	.750
SDAM Item 15	24.00	16.280	.448	.767
SDAM Item 19	23.85	16.679	.498	.758
SDAM Item 27	23.66	16.715	.521	.754
SDAM Item 28	23.70	15.001	.528	.752

**Scale Statistics**

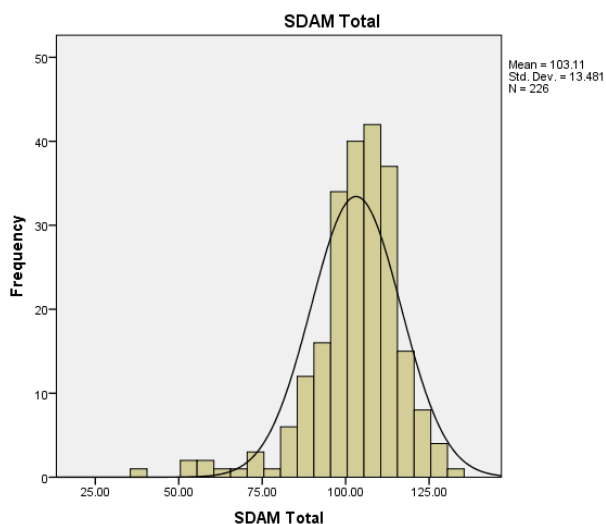
Mean	Variance	Std. Deviation	N of Items
27.76	21.047	4.588	7

**Statistics**

		SDAM Total	Emotional Self-efficacy Scale Total
N	Valid	226	226
	Missing	0	0
Mean		103.1106	118.31

Median	105.0000	118.00
Std. Deviation	13.48089	16.247
Skewness	-1.450	-.145
Std. Error of Skewness	.162	.162
Kurtosis	4.211	1.326
Std. Error of Kurtosis	.322	.322

## Histogram



## Correlations SDAM and Psychological Measures

		SDAM Total	Lot Total Scores	Emotional Self-efficacy Scale Total
SDAM Total	Pearson Correlation	1	.089	.113*

	Sig. (1-tailed)			.092		.046
	N	226		226		226
Lot Total Scores	Pearson	.089		1		.377**
	Correlation					
	Sig. (1-tailed)	.092				.000
	N	226		226		226
Emotional Self-efficacy Scale	Pearson	.113*		.377**		1
Total	Correlation					
	Sig. (1-tailed)	.046		.000		
	N	226		226		226

\*. Correlation is significant at the 0.05 level (1-tailed).

\*\*. Correlation is significant at the 0.01 level (1-tailed).

## Correlations SDAM Subscales and Psychological Measures

### Correlations

		Emotional Self- efficacy Scale Total	Lot Total Scores	Environmental Subscale Total	Social Subscale Total	Economic Subscale Total	Other Items Total
Emotional Self- efficacy Scale Total	Pearson Correlation	1	.377**	-.044	.142*	.113*	2*
	Sig. (1- tailed)		.000	.257	.016	.044	.017
	N	226	226	226	226	226	226
Lot Total Scores	Pearson Correlation	.377**	1	-.075	.090	.133*	.131*
	Sig. (1- tailed)	.000		.132	.088	.023	.025
	N	226	226	226	226	226	226
Environmental Subscale Total	Pearson Correlation	-.044	-.075	1	.543**	.372**	.454**
	Sig. (1- tailed)	.257	.132		.000	.000	.000
	N	226	226	226	226	226	226
Social Subscale Total	Pearson Correlation	.142*	.090	.543**	1	.516**	.675**

	Sig. (1-tailed)	.016	.088	.000		.000	.000
	N	226	226	226	226	226	226
Economic Subscale Total	Pearson Correlation	.113*	.133*	.372**	.516**	1	.530**
	Sig. (1-tailed)	.044	.023	.000	.000		.000
	N	226	226	226	226	226	226
Other Items Total	Pearson Correlation	.142*	.131*	.454**	.675**	.530**	1
	Sig. (1-tailed)	.017	.025	.000	.000	.000	
	N	226	226	226	226	226	226

\*\* . Correlation is significant at the 0.01 level (1-tailed).

\* . Correlation is significant at the 0.05 level (1-tailed).

**Appendix 7**

<p><b><u>1. Knowledge – what they actually know about sustainability</u></b></p>	<p><b>Things I want to cover – use as prompts if not covered</b></p>	<p><b>Notes</b></p>
<p><b>What do you understand by the terms S/SD?</b></p> <p><b>What immediately comes to mind when you think of the terms S and SD</b></p> <p><b>Think of 3 three words associated with SD/S</b></p>	<ul style="list-style-type: none"> <li>• Just a buzz word? Important?</li> <li>• Familiarity - superficial knowledge or in-depth?</li> <li>• Aware of the 3 dimensions? Meaning of each provided?</li> <li>• Definition provided? Brundtland?</li> <li>• Meaning provided?</li> <li>• Words associated with?</li> <li>• Issues surrounding it? Climate change etc.</li> <li>• Technology mentioned? To what extent do they think it will help? Solve it?</li> <li>• Purpose? What SD/S sets out to achieve? (Minimize environmental impact</li> <li>• Enhance life cycle performance</li> <li>• Enhance recycling/renewable application</li> <li>• Enhance resources usage efficiency</li> <li>• Improve reliability and performance</li> <li>• of materials and systems</li> <li>• Improve energy efficiency</li> <li>• Improve design practices</li> <li>• Quality of products</li> <li>• Improve or maintain quality of life</li> <li>• Safety)</li> </ul>	

<p><b>2. Own perceptions of Sustainability</b></p>		<p><b>Notes</b></p>
<p><b>What would you say has informed your perceptions of S/SD? (What's influenced them – how did they get there – how did they come about these perceptions?)</b></p>	<ul style="list-style-type: none"> <li>• Work/Occupation</li> <li>• Government</li> <li>• Lectures, media,</li> <li>• Does their company engage/implement any S practices?? If <b>NO</b> - reasons for this?</li> <li>• Anything they do in personal life? ( Eat seasonal produce/organic food</li> <li>• Prefer products with eco-labels.</li> <li>• Recycle/use recycled product</li> <li>• Turn lights off</li> <li>• Use less energy/energy saving technologies in the home? Light bulbs? Wear extra layers of clothing rather than put heating on? <u>Is this to save money rather than concern for environment</u></li> </ul>	



	<ul style="list-style-type: none"> <li>• Use public transport/cycle rather than drive?</li> <li>• Waste avoidance? Carrier bags – reuse or have for life bag</li> <li>• Do you ever point out unsustainable behaviours to anyone?)</li> <li>• Brought up with it</li> <li>• Worthwhile? Necessary? Beneficial?</li> <li>• Are the a clear advocate/passionate or not bothered</li> </ul>	
<p><b>3. Perceptions of how they think industry is adopting sustainability</b></p>		<p><b>Notes</b></p>
<p>What are your thoughts about the construction industry and S/SD?</p>	<p>Do they think CI can help? Should it help? How?</p> <p>Doing enough already? Could do more? How?</p> <p>Extent industry contributes to SD issues?</p> <p>Environmental Impact?</p> <p>Responsible for high-energy consumption (50% of all worldwide energy usage),</p> <ul style="list-style-type: none"> <li>• solid waste generation,</li> <li>• global greenhouse gas emissions, external and internal pollution, environmental damage</li> <li>• resource depletion including water consumption</li> </ul>	

	<p>Importance for sustainability:</p> <ul style="list-style-type: none"><li>• One of the biggest industries that can make a difference to S</li><li>• Environmental protection</li><li>• healthier built environment and ecological systems,</li><li>• energy conservation/improve energy efficiency</li><li>• better comfort,</li><li>• waste reduction,</li><li>• resource conservation,</li><li>• better service life prediction and enhancement</li><li>• ensuring quality of life for future generations</li></ul> <p><b>What Industry can do:</b></p> <ul style="list-style-type: none"><li>• Waste reduction</li><li>• Use less energy – via?</li><li>• Import/use locally sourced materials</li><li>• reduce carbon footprints, ecology and environment protection,</li><li>• healthy indoor and outdoor environment, water use reduction, energy</li><li>• efficiency, eliminating environmentally harmful materials,</li><li>• improve resource efficiency,</li><li>• conserve resources of land and</li><li>• raw materials</li></ul>	
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	<ul style="list-style-type: none"> <li>• Improve design and construction practice</li> </ul> <p>Aware of what industry is doing? Doing enough?</p> <ul style="list-style-type: none"> <li>• Identifies Sustainable or green ratings systems/initiatives:</li> <li>• Constructing Excellence</li> <li>• CIB (<i>BREEAM, LEED, ISO 14000, A21, LCA, POLICY/REGS, GOV INCENTIVES ,Landfill Tax and Aggregate Levy</i>) BIM, Construction 2025 strategy</li> <li>• <i>Reluctant – why? Risky/barriers mentioned? Lack of client demand</i></li> </ul> <p>One Sector more important? Responsibility?</p> <ul style="list-style-type: none"> <li>• Engineering</li> <li>• Architecture</li> <li>• Contractors</li> <li>• <i>Government</i></li> <li>• <i>Industry</i></li> <li>• <i>Professional/educational bodies</i></li> <li>• <i>The supply chain users – clients etc.</i></li> </ul> <p>Benefits for industry? Do they think there are any? Costs savings? Greater marketing profile/market advantage,</p>	
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	Should they create client/market demand	
4. What they think would change perceptions towards sustainability		<b>Notes</b>
<p><b>What do you think would help to change peoples' perceptions of S and for industry to adopt more S practices?</b></p>	<ul style="list-style-type: none"> <li>• <i>Increase training and education opportunities?</i></li> <li>• <i>Inc. in curriculum/CPD?</i></li> <li>• <i>Exemplar projects?</i></li> <li>• Sharing of knowledge</li> <li>• Disseminate information</li> <li>• Networking and working together</li> <li>• Learning from peers</li> <li>• Research new ideas</li> <li>• <i>Raising awareness through campaigns, education and training</i></li> </ul> <p>Changes required/are necessary to achieve SD/S? <i>change Perceptions/attitudes in industry?</i></p> <p><i>Motivators:</i></p> <p><b>Company ethos</b> and the commitment of the organisation to more sustainable development</p> <ul style="list-style-type: none"> <li>• <b>PR and publicity</b> gaining a reputation for developing more sustainably may help to promote sales and provide a market advantage,</li> </ul>	

	<ul style="list-style-type: none"><li>• <b>Regulation and legislation</b> developers identified that they are building more sustainable developments because they are required to do so, for example changes in the Building Regulations</li><li>• <b>Local authority influence</b> the local authority requesting or supporting more sustainable development helps motivate developers in order to gain planning permission</li><li>• <b>Client demand</b></li></ul> <p>Particular drivers that would change perceptions?</p> <ul style="list-style-type: none"><li>• Financial incentives/rewards</li><li>• Building regulations/policy</li><li>• Client awareness</li><li>• Client demand</li><li>• Planning policy</li><li>• Taxes/levies</li><li>• Investment</li><li>• Cost evidence – exemplar projects</li><li>• Support from local authorities</li></ul> <p>Barriers?</p> <p>Cost</p>	
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	<p>Policy</p> <p>Legislation</p> <p>Lack of client demand</p>	
<p><b>5. How do you think education can help (in industry)?</b></p>	<ul style="list-style-type: none"> <li>• Research useful?</li> <li>• Collaboration between HE's and Industry? HOW?</li> <li>• Feedback important?</li> </ul>	<p><b>Notes</b></p>
<p><b>Profs</b> Have you previously experienced formal education addressing sustainability and sustainable Development?</p>	<p>Any projects they have worked on?</p>	
<p><b>Students</b> - Have you participated in any modules which addressed sustainability or sustainable development? Based on what you have learned, how do you think this might help to move the S agenda forward?</p>	<p>Can you give a particular example of a previous module/topic in which sustainable development or sustainability was addressed?</p> <p>Or example of S issues addressed in your modules and how you think provision of such information may help change perceptions of S</p>	

## Appendix 8

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**From:** Smith, Charlie  
**Sent:** 26 September 2012 11:21  
**To:** 4048AR; 5048AR; 6048AR; 7005MARCH; 7009MARCH  
**Cc:** Wroot, Ian; Brennan, Michelle  
**Subject:** REQUEST FOR VOLUNTEERS FOR A RESEARCH PROJECT

Hi

Please find below a message from a PhD student who is researching sustainability in the construction industry, and at the design stage in particular. If you are interested in volunteering, and making a valued and valuable contribution to her research, please email Michelle directly by Monday next week. And please remember to include which cohort you are from. Many thanks. Charlie.

[M.Brennan@ljmu.ac.uk](mailto:M.Brennan@ljmu.ac.uk)

Dear Students,

My name is Michelle Brennan, I am PhD student in the School of the Built Environment. I am conducting research into attitudes towards sustainability in the construction industry and am particularly interested in the design sector as the literature indicates that the design stage of construction projects is not only one of the potential largest contributors to environmental impacts but also an integral stage as to where sustainability can be implemented.

The attached Participant Information Sheet sets out what would be required from you if you agree to take part.

Sustainability is a very important topic in the construction industry at the moment and thus this research may potentially help to inform both professional practice and higher education curricula on such issues.

Thank you in anticipation,

Kind regards,

Michelle Brennan

## Appendix 9



### INFORMATION SHEET FOR PARTICIPANTS

#### **Name of Researcher and School/Faculty**

Michelle Brennan, School of the Built Environment, LJMU

You are being invited to take part in a PhD research study. Before you decide it is important that you understand why the research is being done and what it involves. Please take time to read the following information. If there is anything that is not clear or if you would like more information please ask. Take time to decide if you want to take part or not.

#### **1. What is the research study about?**

The aim of this study is to ascertain understanding and views of sustainability issues, attitudes towards the environment and environmental sustainability.

#### **2. Do I have to take part?**

Participation in the study is completely voluntary and you are not obliged to take part. If you do take part you will be asked to provide consent. You may withdraw from the study at any time you wish and you do not have to provide a reason.

#### **3. What will happen to me if I take part?**

You will be asked to meet to take part in a focus group to discuss the topic of sustainable development. The focus group will last approximately 1 hour. You will be asked a number of questions as a group and to discuss the same. You are not expected to be an expert on the topic, just to bring what if anything you do know about it to the discussion. The discussion will be recorded for the purposes of qualitative analysis.

#### **4. What are the possible disadvantages and risks involved, if any?**

There are no disadvantages or risks in taking part.



## **5. What are the possible benefits of taking part?**

In taking part, you will get a chance to discuss your knowledge of sustainable development and also gain knowledge from others in the group. Evidence shows that many employers are now looking for graduates who demonstrate knowledge of sustainability issues and that there is a significant shortage of suitably qualified professionals. Becoming engaged in discussions about the same will put you in good practice for interviews and thus at a competitive edge in the employment market.

## **6. Will my taking part in this study be kept confidential?**

All information provided will be kept strictly confidential. You do not have to provide your name and your signature on the consent form can be just your initials if you wish. Signed consent forms will be kept separate from any information you provide. All information will be securely held by the researcher. Any information provided, data collected and electronic recordings will be securely stored and will be destroyed by shredding or electronic deletion after a minimum of 4 years of completing the study.

## **7. What will happen to the results of the research study?**

The results of the research will be used for a PhD dissertation, which may be published in an academic journal. You will **not** be identified in any report or publication.

## **8. Has this study been approved by an ethics committee?**

This study has gained ethical approval from the Liverpool John Moores Research Ethics Committee (REC).

## **9. Who should I contact with enquiries about this study?**

Any questions that you have about your participation, withdrawal, role in the study or in general, should be addressed to Michelle Brennan, the principal researcher **and/or Dr Alison Cotgrave, Principal Supervisor.**

Michelle Brennan, School of The Built Environment, Liverpool John Moores University, Henry Cotton Building, 15-21 Webster Street, L3 2ET [M.Brennan@ljmu.ac.uk](mailto:M.Brennan@ljmu.ac.uk)

**Dr Alison Cotgrave, Deputy Director of School of The Built Environment, Liverpool John Moores University, [A.J.Cotgrave@ljmu.ac.uk](mailto:A.J.Cotgrave@ljmu.ac.uk)**

## Appendix 10

Dear NAME,

I have been given your contact details from my employer as a potential recruit for my research.

I am a PhD student at Liverpool John Moores University conducting research on sustainable development in the built environment. I would be grateful if you would consider taking part in my research. Your participation will involve taking part in a focus group to discuss sustainable development. The focus groups will last approximately 1hr however please allow for 2 hours. The focus groups can be held at the LJMU Peter Jost Centre or at a place of your convenience. If you could please indicate your availability and email the principal researcher [M.Brennan@ljmu.ac.uk](mailto:M.Brennan@ljmu.ac.uk) to arrange a convenient date, time and place.

The attached information sheet provides more detailed information and sets out the process and aim of the research.

I look forward to forward to hearing from you.

Kind regards,

Michelle Brennan

PhD Research Student

LJMU

## Appendix 11



### INFORMATION SHEET FOR PARTICIPANTS

#### **Name of Researcher and School/Faculty**

Michelle Brennan, School of the Built Environment, LJMU

You are being invited to take part in a PhD research study. Before you decide it is important that you understand why the research is being done and what it involves. Please take time to read the following information. If there is anything that is not clear or if you would like more information please ask. Take time to decide if you want to take part or not.

#### **1. What is the research study about?**

The aim of this study is implement educational interventions over a period of time and assess attitudes towards sustainability in the built environment throughout.

#### **2. Do I have to take part?**

Participation in the study is completely voluntary and you are not obliged to take part. If you do take part you will be asked to provide consent. You may withdraw from the study at any time you wish and you do not have to provide a reason.

#### **3. What will happen to me if I take part?**

You will be asked to meet to take part in a focus group to discuss the topic of sustainable development. The focus group will last approximately 1 hour. You will be asked a number of questions as a group and to discuss the same. You are not expected to be an expert on the topic, just to bring what if anything you do know about it to the discussion. The discussion will be recorded for the purposes of qualitative analysis. Prior to the focus group proceeding, you will be required to fill in a number of short questionnaires which will take no more than 15 minutes (these can be sent via email if you prefer to complete in your own time).

#### **4. What are the possible disadvantages and risks involved, if any?**

There are no disadvantages or risks in taking part.

## **5. What are the possible benefits of taking part?**

Sustainability is becoming a priority for both government and industry and as such the way industry works is changing. Such changes will have financial implications for businesses. Those that have a better understanding of sustainability will therefore be at advantage in the market place.

The outcomes of this study will help to inform sustainability literacy education at both higher education and professional level thus providing for better teaching delivery of such issues.

## **6. Will my taking part in this study be kept confidential?**

All information provided will be kept strictly confidential. You do not have to provide your name on any of the questionnaires and your signature on the consent form can be just your initials if you wish. Signed consent forms will be kept separate from any information you provide. All information will be securely held by the researcher. Any information provided, data collected and electronic recordings will be securely stored and will be destroyed by shredding or electronic deletion after a minimum of 4 years of completing the study.

## **7. What will happen to the results of the research study?**

The results of the research will be used for a PhD dissertation, which may be published in an academic journal. You will not be identified in any report or publication.

## **8. Has this study been approved by an ethics committee?**

This study has gained ethical approval from the Liverpool John Moores Research Ethics Committee (REC).

## **9. Who should I contact with enquiries about this study?**

Any questions that you have about your participation, withdrawal, role in the study or in general, should be addressed to Michelle Brennan, the principal researcher and/or Dr Alison Cotgrave, Principal Supervisor.

Michelle Brennan, School of The Built Environment, Liverpool John Moores University, Henry Cotton Building, 15-21 Webster Street, L3 2ET [M.Brennan@ljmu.ac.uk](mailto:M.Brennan@ljmu.ac.uk)

Dr Alison Cotgrave, Deputy Director of School of the Built Environment, Liverpool John Moores University, [A.J.Cotgrave@ljmu.ac.uk](mailto:A.J.Cotgrave@ljmu.ac.uk)

## Appendix 12

### Pilot Focus Group Transcript

M If you could all just start by telling me what you know about sustainability, what your understanding of it is or what springs to mind when you hear the words sustainability or sustainable development?

PP 1 preserving for the future generations

PP2 I guess for me it's reducing the embodied energy currently in the materials and also practicing using passive techniques, passive ventilation and less reliance on mechanical means

PP3 Just providing the needs for the time we are in

M How do you mean?

PP3 Such as you wouldn't be able to provide such as the Roman sustainability such as the environment industries for now days it's all orientated differently and the mechanics used are slightly different therefore you have to approach it in a different way and try and maintain or increase the needs of the environment

M From the technology that we've got today?

PP3 Yeah

M Ok, so are any of you aware of the 3 dimensions of S?

PP2 Not quite no

M No, ok, the economic, environmental and the social aspects?

PP3 Yes that springs to mind

M What do you know about it, can you tell me anything?

PP3 I'll have to give it a bit of thought

M Ok anyone else?

PP1 Erm I can't really, because I've heard of it before I've heard of those 3 things but I can't really think about it now, I can't remember

M Don't worry I'm not testing your knowledge I just want to know, get your understanding of what you do know, are you aware of any of the definitions of sustainability? Do you know the definitions at all? Have you come across any definitions in your studies?

PP3 social would that be providing the needs of people in the area therefore such as needs to accommodate them social as in leisure activities and those sorts of things

PP1 Economically isn't it providing energy at a Sustainable cost for the now generation

M There's no right or wrong answers I'm just trying to understand what you know and what your perceptions of it are and your attitudes towards it as well

PP3 What about the energy flow through a town or city wouldn't that have to be sustained such as where it's directed towards and where it's taken out of?

M So you think that that's a part of sustainability?

PP3 Yeah

PP2 I think BREEAMs an interesting idea for Sustainability, you know you cover your social and then you've got your economical that you try and a BREEAM rating looks better if you are trying to sell or let property or let it because that's what investors want to be seen as green and then you can use environmental methods erm as BREEAM buildings do and then you go along the rating system, so you have good excellent erm ok and then you have outstanding, but that's what we have learned but you usually find that if you put your architecture around a BREEAM rating that it is quite hard and that the architecture can start ending up like you're just sticking in elements of S design. That's just what we've really looked at and touched, we don't really cover mainly, I've never really covered the 3 points of sustainability it's mainly key systems and how you put them into it around your building rather than looking at everything else

M Implement them into your design?

PP2 Yeah

M How important then do you think BREEAM should be?

PP2 Erm I think it's important but I think some of it is more of a money exercise, its if you can get a good rating like the Art and Design Academy's rating is good, but they've never done a post occupancy to see if it works, which it probably wouldn't really the systems weren't put in quite right but I think a lot of it it's about money if get a good rating you'll get more people interested in your building rather than thinking of the sustainable long term advantage

M So you think they do it purely for monetary purposes rather than they want a green building for it to purposely be green?

**PP2** I don't know if you look at somewhere like a corporate headquarters like erm Norman Fosters British Bank Building but that's a building that's got a sustainable agenda in mind so you've got your terraces slotted around the building, that's working to a sustainable agenda by but still producing a piece of architecture but if you look at something like I think there's a Cardiff university building that's just been done, and that's just trying, it's not a nice looking building

**PP4** Is that the park?

**PP2** Yeah it's not a nice looking building its just trying to get as much, it's trying to get good a rating as it possibly can, and it's the same in London there are a lot of buildings in London which have very good BREEAM ratings but they're not visually or aesthetically very nice

**M** Ok has anyone got any comments on that or?

**PP1** Erm well no I agree with what you were saying about the BREEAM rating because I know the ADA building it did get like a good because it had I think it's got a biomass?

**PP2** Yeah it's got a biomass

**PP1** And it just but they don't use it do they?

**PP2** Oh well they fitted it in the wrong way when they first done the building, the builders didn't know which way it went in and then they never worked out where to store the fuel so you can't light the biomass boiler so they have to rely on a gas boiler

**PP1** So they have a biomass boiler but they can't use I think that probably gets them a good BREEAM rating as well

**PP2** Yeah and there's something night cooling so you can draw air across a concrete slab and take the heat out but no one ever tells you if it works, there's quite a few, there's a shower upstairs as well on the 4<sup>th</sup> floor, down in the bottom in the basement so you're supposed to in on your bicycle and go for a shower, that's never worked

**PP1** No

**M** What do you think of sustainability in terms of climate change?

**PP4** I think there's quite a few developments been on like. It's not really the architects job, it's like you've got your solar panels you've got wind turbines you've got all those types of technology coming in, especially Anglesey has got Energy Island campaign going on, like I've known because were working for some of the people for the new power station that's being built, I think they do tend to use a lot more solar panels

but there's has been quite a few obligations about the wind farms, they put them out to sea an stuff now and do all the tidal wave, so they are trying to like, I think it needs a bit more development like to use eco efficiency but I think it will just take time because mainly people are thinking looking at new buildings they're meant to be given a modern aspect something new for something nice to look at, they haven't really thought about how it would work, how is it using renewable energy as such it depends. You see it more in the countryside now from like mainly a terraced house I think the new ones they have to have a solar panel on so I think it's mainly you don't see much of it in the city compared to what you see on the outskirts I think it's something new that will come along

M Right ok, do you think technology plays a big part in the reduction in climate change, does anyone else think that or want to add to it or

PP1 Well it's to do with manufacturers as well to develop the materials that can actually adapt to the environment that the architects design for, obviously we're not at tipping point yet but it will happen at some time if we don't start changing our ways, fossil fuels will run out so we got to start looking for new materials that can be sustained for the future

M When you say tipping point what do you mean? Sort of getting to the of

PP1 Getting to the end of what earth can sustain, once you go past tipping point there's no way back

M Right ok, would anyone agree with that or you think that there are things that we will be able to do or

PP2 I think if you looked at buildings and thoughtfully thought where you're going to place it so instead of placing a building at the south elevation so you get excessive solar gain and putting it on maybe a north one and it reduced and then using the sides the east and the west and there are a lot of buildings in Liverpool that are a bit stupidly placed and don't take advantage of where they are. Like there's lots of natural wind coming up the estuary but I've never seen anyone try and capture it, not as a wind turbine or anything like that but even forms that scoop the air and bring it down as a form of ventilation could be easily done but I think it's down to how do you teach people, you now how do you teach them sustainable design, the first part is just showing them that if you put a building in different places it will incur different things, BREEAM, not



BREEAM, you know the BIM is a good thing to learn, because it helps you model the way you're going to go, it's something I've only started looking at right now

M Ok, what would you say has informed your perceptions of sustainability or sustainable development? Is it just what you know from being on your degree courses or is there anything in your personal life that

PP1 I did geography at A level and Sustainability was a huge part of the course that's where I learnt from basically

PP2 Mines very similar I did geography as well and I have lectures on it so it's pretty much just schooling and education is where I pick it up

M Are you sustainable in your own everyday lives or is there anything

PP4 erm mine's is because I come from Anglesey so they've got a new development going on and I've been a part of seeing the designs of a new power station which has come in as personal experience really and I've got family members that are solar panel fitters and stuff so I've kind of grown up around and been introduced into the eco efficiency side of things and how new buildings have been developed to try and make that more sustainable especially for the Energy Island programme that's kind of a key base for the new power station so I've been taught from personal experience and people I know that work on the site and stuff (1<sup>st</sup>yr)

M Ok what about you anything?

PP1 There are a few turbines and solar panels out where I live but there not majorly impressive in terms of how much energy they produce seen as though we are populated by hills, surroundings, whereas the turbines are in the hills but there just aren't that many to provide sufficient energy to maybe happening to accommodate the whole town. So to say maybe a few buildings

M mm but it's something that you are aware of that's in your community when you are at home

PP1 Yeah yeah you can see sustainability taking place in terms of the eco but other than that not really

M Anything that you've learned sort of education wise then is there anything that immediately springs to mind when you think of sustainability or sustainable development?

- PP1 I guess it's moving forward not just staying in one place where all you do is stay on track with one type of living in a way, possibly improving and wanting a better life but then again you have to sustain that via means, a job and income all come into play so it's getting a fair share of everything and its finding equilibrium through that – as in with every day to day necessities.
- M You think everyone should have a fair share, do you mean you think everyone should have a fair share, jobs and equilibrium for everyone
- PP1 As in with every day to day erm necessities yes
- M Ok, erm how important do you think sustainability is
- PP1 Very, well certainly for poorer countries as they're seeing the effects more as rich countries like MEDCs can afford, they pollute, but we can take the measures to protect ourselves against climate change but places such as Bangladesh who are on low flood panes they're seeing the effects of sea rise and earthquake prone areas as well they're all seeing the effects of climate change whereas the MEDCs aren't really so if we don't feel the effects we might not necessarily feel that we should have to change it whereas the poor income countries are
- M But do you think it's us that is causing the impact on the third world countries yeah
- PP1 Yeah, Yeah because we can afford all the big factories and to use all this energy and they can't
- M Anyone else how important you think sustainability is?
- PP1 Yeah I think it is, we are having an impact on the world I don't know how big of an impact we are having or if it's just kind of a cycle which is kind of changing but even if we aren't having an impact its worth changing anyway in case we are, if that makes sense, because we don't know if we are actually doing a big change to the world but even if we are not we may as well change anyway just in case I think
- PP4 I think we can do much more compared to other countries like globally, like Sweden that's the most eco efficient county we are down 14<sup>th</sup> it isn't looking to well, there is so much we can do there is so much new development being there and people just don't take the risks of it. yes it does cost quite an amount of money to set things up but over time it does pay off and it does create its own energy so I think people need to take risks and think more about what the next generation want as well because many people like they say kids are the future they haven't really they don't take it into

consideration and they think it might only be words to them but they really need to sort things out more I think because the opportunity is there, it's not like it isn't there it's not being developed, it has been and it's still growing they just need to embrace that

M why do you think that they're not taking these risks and implementing more sustainable measures?

PP4 I think they're all about money wise I think that's playing on everyone's mind at the moment. With the value of the euro changing globally I think yes it will take but once one person starts then it should carry on as a pattern sort of thing

PP1 Yeah, it's our responsibility as well to educate the new the countries like India who are developing, we have to educate them, they have to develop in a sustainable as if they just continue like we did then it will reach tipping point

PP2 I think, it's because it's not cost-effective that's the honest answer it costs them too much so they're not going to do it and it's also about people's perceptions. I can design a house and have passive ventilation etc. but people aren't going to want to live it because they're used to a nice warm comfortable insulated house with a gas fire and maybe if they wanted to add some air conditioning as well. If you're wanting change, it will take a long time to change people's perceptions of what they're going to want and I don't think, the only way to make it is if say you get a developer, a large scale developer to find the costs of doing environmental stuff is worth their while and until then they'll just produce what they've always produced on the same template until well until its ran out.

M So like Barrett Homes for example unless they start building all these eco homes on a large scale development you don't think people will

PP2 There's one, Its bedhead or something it's Bed something, and this architect did a series on a big book called Sustainability in Architecture and it's a big front cover and you look at them and you're like no normal person is going to live in them nobody from Liverpool is not going to, they're not going to build a few in Liverpool and think that's right we're going to help people that way, they're too expensive, cost prohibitive and they're not done on such a mass scale that, if you did it on a mass scale then you'd be able to lower the costs but it's always then a slight few and it's because people are unwilling to do it

- PP1 Yeah well in today's current climate if manufacturers can find a way to reduce bills and stop energy being wasted then people will purchase the technology especially if they're going to save money on energy and heating bills
- PP3 I don't think it's sometimes down to technology as well I think it's having enough insulation in buildings as well like I'm designing a building right now for my project and it's got a 500mm concrete slab and then 500mm of insulation so 1m altogether slab and that will get me down to I think about an E value of 0.2 I think talking to my tutor but I've had to go out of my way to design something like that and it's probably not going to be cost-effective to do it like that and it's just whether you want to do it or not that's the main thing
- M Ok so what are your perceptions of how you think the industry is adopting sustainability? You know you said they don't take risks but do you think that they're doing enough? Do you think there's, what more could they do?
- PP1 I think a disaster has to occur to remind them that there must be another way forward such as let's say the Japanese when they had the tsunami, in my opinion I think they will become more sustainable in terms of green efficiency and the planning once they rebuild, it will be cost-effective in that term and also to fit in with the weather and the climate and the way it's going forward global warming they will have to go towards that, towards sustaining their town their city in a more futuristic way whereby it would be relying on natural resources such as well such as the wave, the wind, the sun a lot more than other countries do that haven't suffered from such devastation seen as everybody's too busy doing their thing away from such calamities I think that's a major part because it doesn't affect them they're not influenced by it
- M In ways do you think the construction industry impacts on say the environment and social aspects and economically, if we start with the environmental impacts of the industry, what are you aware of in the ways that its impacts on the environment?
- PP3 Well car manufacturers and the amount of petrol gas and co2 the carbon monoxide that's released into the atmosphere. If there were fewer car manufacturers then I guess there would be fewer cars on the road and therefore fewer gases in the atmosphere that would be economically friendly as
- M Just the construction industry itself so say what they're doing out there now, the impact that that's having on the environment

- PP1 Its mostly the manufacturing of the actual materials themselves that does the most damage, and the transport of it to site, when its up it's only the heating, that's going to do damage as well but I think the manufacturing industry has to play a bigger role in their machines and stuff into reducing co2 emissions and stuff
- PP3 But then again once the building is built if its eco-friendly enough to regain back what it had before it was built such as say the carbon which was in the soil if it could possibly replace that through what they do within the interior and the materials they've used then I guess it balances out that sustainability in a way
- M Ok, what do you think the industry can do then to reduce the impact it has?
- PP2 Thinking more about refurbishing buildings rather than knocking them down rather than building new just refurbish but that takes effort doesn't it really
- PP3 Or use the present materials in the old building
- PP1 Yeah use the old materials, and recycling the materials
- PP2 Extend the life the building is supposed to be built for
- PP1 Yeah instead of importing special glass from Germany for a building why can't it be manufactured over here
- M Is there anything else?
- PP2 I don't know, I think raising the amount of time you want that building to stand is quite interesting. I think the A&DA I think they said maybe in about another 40 years and then it should be I think it might be demolished or it would have to go through extensive refurbishment because the whole façade is special brick made in Germany which NAME wanted, but its now I don't know the specifics but it's not actually good for I think it's a warming environment, I think it's not very good, so but it's a nice structure and it could be reused again but I think there is a thing both as architects and the construction industry that if a building can't be reused it has to be knocked down and started again continuously.
- M Why do you think that is?
- PP2 I think it's because if buildings were made to last there would be less work for all of us
- M So again it's that cost, the economic factor
- PP2 Yeah if I built a building that would last for a 100 years then there's say I was working for another 50 and it went it 40 I could maybe do another building in 10, 4 years' time,

there's a lot of money to be made in keeping buildings that don't last for as long as they should do

M Ok, anyone else got any comments on that or other ways you think the industry impacts on the environment or socially, noise?

PP1 You can't really get away from noise pollution to be honest with you

M Do you not think that there's more that they could do?

PP1 Apart from putting big, surrounding the whole work site with sound proofing then no

M Which isn't very cost-effective

PP1 I think it's mostly unavoidable noise like that unless its constructed offsite but I don't think what they're doing is kind of able to do that I think it's mostly unavoidable

M What do you think about offsite construction then?

PP1 Erm well I don't know a massive amount about it but erm I think if it's going to be in the inner city centre then offsite construction, it would work well but then again that's adding to transport costs, its adding to the impact it puts on the environment just so people can kind of have a nice social environment, its juts kind of which side you're wanting to go whether its making it better for the people or better for the environment really

PP2 I think you can get a bit repetitive, you know it's great having a prefab building made in a factory because everything will be pristine and well-made but then people might get a bit lazy, you know what's going to happen that they'll think I'll make the building and say I'll do it in 3x3 blocks and then I'll have 3 blocks at 9 metre and if anything it just gets a bit lazy that that will be the building and I'll just do another one on top and there's another floor and I'll stick a lobby on the end there we go there's a building and its sustainable because I've done it all in the factory and I've used less waste and I've made it with these very fancy materials which are environmentally friendly. I think prefab is good but I don't know it's all about how you use materials isn't it, you can do a building which has got concrete which is formed on site but it depends what type of concrete you use you could use one that's got flu ash which reduces its embodied content by 30% and then you're saving energy and then your also making the building look good aren't you really so there's no real, prefabrication is great but there are other ways

- M Ok are there any other ways you think the industry could help in sustainability or ways that it contributes to it, negatively or positively
- PP1 I think set aside a budget maybe to have a look at more sustainable techniques
- M Do you think that one sector should be more responsible in a way than another sector of industry, do you think that there's one which should play a more important role than another
- PP3 Well the profession architectural technologists don't they see how the building works and how friendly it is to the environment and its efficiency therefore I think there should be more of those kind of architects, engineers looking forward to producing a building which is a lot more efficient rather than just designing a fancy building like the architects
- PP1 I think it's down to the teachers, like our tutors they should be implementing, impressing on us that sustainability is the way forward and again yeah it should be the architects role as well as we have a main influence over the rest of the body
- M What do you think would help change people's perceptions of sustainability in industry and outside, you said increase on your modules etc. education, is there anything else that you think would help change perceptions
- PP1 cost-effective to the industry, it's all down to money again. People will only use it if it costs them less money, because I don't think well nobody's really kind of like against having a sustainable building or against making it because it's purely just, it's not cost-effective for them to do that so if you can make it cost-effective they've got no reason not to do it really so that's the only thing I think we needs to be fixed because you can change people's perception but they're still not going to do it unless it's like really, money
- PP3 I think the main reason why it's become a lot more successful lately is due to the rising costs of living and people are beginning to realise that it's not affordable and therefore they need to be sustaining their lives in a more efficient way and therefore maybe using a solar panel on their house and maybe a little wind turbine and possibly central heating under the ground would be a lot more costs effective and easier living, that would be one large factor which is why I think a lot of people such as residents would consider that and that's what brought it to their realisation that they need to do something about it instead of just spending a lot of money that's not really affordable

PP2 I don't think people have been very well educated about sustainability, I mean publicly I don't think they have, I think a good example is solar panels, they are brilliant, we get energy from the sun its brilliant you get some free energy sell it back you make a lot of money but when you look at the percentage of how much solar rays you're going to trap it's about like the highest you can get is about 10%-12% I don't know the specifics but and then you've got to think of it, nobody tells them that they become less effective the hotter it gets so you've got to think what elevation you put it on and it's all a bit like, I've seen people like sticking on like west elevations, north elevations and you're like nobody's really thinking about it it's just let's put it on there and see where we go from here and nobody's ever educated them to say well you know it's not really that good and you know if you put a bit more insulation in your house you'll reduce those costs and you know if you get a better gas fire, I know gas isn't a thing but if you get a more better one in if you can change your appliances to A rated you'll save the money that you were trying to save from putting some solar panels on your roof

PP5 I think we need to look at other countries like Iceland who use geothermal energy to heat houses and pavements and we need to take pointers from them as well.

PP1 It's all about the location as well really because like in Iceland obviously they've got the volcano and things like that so they'll be able to use geothermal

PP5 I think its Norway or Denmark or somewhere where has a lot of hydroelectric power as well so it's about finding the right type of sustainable energy for that environment really. Like wind is probably one of the good ones for us but erm yeah just kind of do that I think

PP2 I don't know I don't really think wind is a good thing, I don't think solar is a good thing for Britain

PP5 Ah not solar

PP1 Wave ?

PP2 Yeah I think wave, we're an island we're surrounded by inlets and things why not use wave technology? Solar its brilliant but it's not really, Britain isn't the sunniest place in the world so I'm not entirely sure why and wind well, well wind is windy

PP5 But in Scotland I think



- PP2 Yeah it's not windy, Scotland is the most windiest, it's the most windiest place in Britain but they've gone for a big drive on solar power which is quite strange and then if you look at countries like Germany who are the leader in solar energy and really they shouldn't be they should be a leader in some different form of energy really, I'd say wave most likely because they've also got a coastline so to speak and maybe geothermal or biomass to be honest
- M So it's about knowledge and knowing sort of those things and where to place them and
- PP1 Yeah it's just finding the right one I think yeah
- M You say it's a more the public aren't educated but do you think the construction industry is educated enough, I know you're all in education now but you know those who are out in there in industry do you think they're educated enough to adopt these sustainability
- PP2 Hmm no because they come from a time I'm guessing like somebody who was educated in the 80s when sustainability was just about coming through they were educated in a time when the minimum requirement in insulation and cavity wall you know build it and carry on to the next building. They don't come from an age where sustainability is the main pressing issue it was all about, it was the 1980s let's make money let's build, build, build.
- PP5 I think they are aware but if the architects aren't finding that builders are sustainable then they can't build
- PP4 They're still learning the same as us really, they're in the same situation as us were like the new generation but the old generation is still learning as well everybody's learning every day, something new is happening every day so you're always erm being, I think the need to do something more, make people more aware, they need something erm like from heating some people just use wood burners or something, they make recycled blocks now from it, for wood shavings from a construction place use the wood shavings they compress them into little blocks now so it's better for using it in like a wood burner instead of using logs and cutting trees down using logs they've got new ideas they are using them they just need to make it a bit more wider ranged to show people that it is possible. It doesn't have to cost that much for you that's why you can recycle your newspapers you can still use that to be burned to give

you heat instead of having to use the heating system in your house or the same with solar panels it doesn't necessarily mean you need direct sunlight all the time because they do work, like now they still would be generating energy now sort of thing

M So knowledge and education is important for everybody both those who are going to be entering industry and construction professionals

PP3 Sorry could I say something?

M Of course yeah

PP3 I think industries do have the understanding and knowledge to an extent where they know about they should be doing, they should be implementing sustainability into their designs and the structures but whose going to go out of their own way to put more effort and money into, well not money I guess effort really and time into designing that kind of a structure and building and reinforcing it into whatever they're producing. It's all about the effort so therefore I think maybe more emphasis needs to go into putting down laws into forcing or in a way forcing them to pledge these procedures and if they haven't got these then the building can't design it seen as though it's to the standards that they should be then that would be a major implication

M So legislation should be more stringent, does anyone else agree or disagree

PP3 Yeah and as architects I wouldn't really like that but it would make a big difference in my opinion

PP2 I think people are scared to take risks, you're scared once you get into practice to bring these ideas to the table because then you or your practice are liable if something goes wrong and it's your head on the block so to speak, it's like if you want to install say use passive ventilation you still have to put in mechanical ventilation just for that couple of days when there isn't the amount of wind and it's a good idea but if you're trying to take risks and it's not very good and I think legislation I think stifles creativity sometimes and the idea of it because you legislate and you keep saying you've got to do this and you've got to do that and you're going to put so much in that but then people just work along to those limits and then they just pass it and then carry on, so I'm all for a bit of less regulation in the system and a bit more power towards, like I'd love for architects to be a bit more influential in the design phase than they are, like a contractor because you're working, if you're working on

behalf of a client they'll bring in a contractor to build that building and it will be the contractor who'll decide what sustainable elements will go into a building, I mean you can suggest it you can design it but it's not 100% that it will go into that building

M So do you think therefore contractors should play a bigger part in the sustainability?

PP2 Contractors should and I don't think contractors really do, I don't think they, they think about sustainability but I don't think they've ever meaningfully tried to incorporate a building, because it comes back to 1 its costs and 2 it's a risk and 3 are they willing to give the control over to the architect to design that because it's a lot of risk to do something like that and are you going to get the reward back, well if you did it to BREEAM you might but in general no, nobody's really going to care are they, they're going to want their, if it's an office they're going to want their nice air conditioning and they'll be happy, and a bit of light so I don't know I think contractors or major construction firms do need to really think about what they do in the industry because it's usually them who the clients are going to and then they're usually the ones who appoint an architect

M Does anyone else have a

PP3 I don't think space available and the planet is being used sufficiently such as for testing I mean as you were saying architects are worried and concerned about their firms their head on the line really when they're building design building implementing ideas which are new and therefore if they do make a mistake then they're on the line therefore it would make more sense to go to a different country where the space is not being utilised properly and maybe construct there and test things out in a way or dedicate a piece of land to testing for the kind of work for research and therefore if it does work then obviously it could be a new era to new technology to implement existing buildings already.

M So technology plays an important part then in sustainability?

PP3 I don't think technology is moving as fast as it could because of the risks which designers would have to take on so

M How important do you think technology is then? Do you think it will help us move along with sustainability or there's other things that need to be done?

PP3 In my opinion I don't really I'm not against technology in a way moving forward but I think it's time to maybe possibly revert back to the ages where it was sustainable

through natural surroundings and not just technology and electricity and thermal heat through radiators and that kind of thing but just playing with what you already have in the area if its sustainable there and therefore that's where cities and towns will grow but not improving into a way where it's just all ruled by technology because technology will have to be provided and accommodated for such as electricity and things like that so I think we need to maybe start going towards a simpler life in terms of that

PP1 well past generations have lived in straw huts I don't see why we can't

PP2 because I don't think people want to live in straw houses

PP1 It's down to attitudes changing the attitude

PP2 I don't think you'd ever change an attitude I don't think anyone would ever live in straw hut to be honest

PP1 If it was between life or death I think you would

PP2 Well if it is but people are never going to have to face that situation are we, we live in a rich westernised world

PP1 We will, future generations will

PP2 Well people don't think about that do they, we think in the now, I've never met anybody who thinks about the next generation thinks about their children, I'm highly doubtful my parents thought about me when they were young and I don't think it will ever happen soon

M Do you think it's like that across industry? They don't sort of see, look to the future?

PP4 People are too set in their ways they won't, they're not willing to change like I think architects they're losing, there's not many jobs going for it now, it's kind of industry where it can struggle sometimes because I don't think they get enough erm for the designs but like it's so cheap to build a timber frames house now you see them go up so quickly because it doesn't take that long to build and it's not that expensive to build and that's on a mass basis but when it comes to like new designs and if we did, like if architects did get the chance to enhance the eco efficiency side of a new building people are not willing to take that on board because of what they already have, they won't take that step forward to thinking of how that could be developed and how that can be influential towards future. They're just a bit stuck in that moment

M Ok does anyone else agree or

PP3 I don't think the media help the public in terms of we are living in an age of now not the future and not for our future generations it's all about our needs and what we want right now.

M Do you think it's like that in the construction industry now, they're very much set in their ways and

PP3 Yeah I do

M Do you think media plays a part in that?

PP3 They do because media is one of the biggest things that publicise and advertise things in terms of knowledge and therefore if the media could perhaps advertise more sustainability and natural resources and greener gases and environments it would subconsciously educate everyone else therefore automatically possibly make them think about the future generations but its, when sustainability comes into mind it's all about sustaining it for the future really because it takes time to implement and therefore it will really take effect and hold its value later on in the years

M Is there anything that you think would be a driver or motivator for it then in industry not so much public but across the construction industry

PP2 I think it's making it interesting because I know it's going to sound really bad sustainability can be quite boring, it can be really, really boring when you get into the details of it and we are constantly bombarded with it and you get a bit empathic with it you know it's like when you watch you know sort of things that donate so much to the refugees in Africa and something like that and after the end you will just flick over to the channels and just watch something else because you've been bombarded with it so much that you just you can't really relate to it anymore and I think that if you wanted to really promote sustainability you'd get the, I always think that a good idea would be like a building expo, like you get developers you get architects and you get them to build something sustainable, whatever they want I don't know like a new art gallery or something fun and exciting that they want to do I think that's the only way, if you can make it interesting and fun, exciting that's how you get people on board, you don't get people on board by sitting them in lectures hall and continuously talking to them from a power point slide because they're just going to go well that's a nice lecture and leave, go to the and forget about it in a few minutes

M So exemplar projects

PP2 Yeah I think exemplar projects, I think trying to use cash incentives maybe for the government to provide buildings which are fun, not fun but you know environmentally sustainable I think having competitions as well lead by government or by the building industry is a good idea, I don't just think that, I think we've all become slightly a bit towards sustainability that's is great it's really interesting but that well it's too much hard work it's too much study it's too much well we just have to sit here and be lectured to and that even if we try we're not trying hard enough and that we try and try and try but no your things not right and it's got to be more green and it doesn't really have to be more green there are different ways to do it but I think its injecting something interesting into sustainability

M Just quickly going back to legislation before we move on to the topic, you sort of didn't you were saying more legislation you were like no it blocks creativity does anyone else think legislation should play a bigger role or smaller role

PP3 Yeah when he was chatting I did think about what I said and I think the best time to take away legislation would be through schools and when educating the next generation that would be the best time to experiment and therefore take away all legislations and the factors for you have to have this and you have to have that why not just send the student out and tell them to explore their ideas come up with design proposals and then go over with say expert architects and maybe then they could possibly move forward because what's better than a fresh young mind whose got loads of imagination who can explore what potentially hard rock say older architects who've lead them a few years before who just won't change their ways

M So you think that the younger generation should teach the older generation who are, do you think that's important for moving it along and it could be a motivator

PP3 Yeah, so more energy into sustainability through that way as well err and be to strict narrow minded possibly but the younger generation will be explosive and

PP2 Not to, sorry, not to make every building outstanding building energy wise that you don't have to purposely make your building the best of the best that sustainability can be done for a few good things rather than making the whole building sustainable, you're going to always have elements in the building which aren't going to be sustainable and I think that you've just got to work around you can't drive people towards sustainability if they're not going to do it. You've just got to show them and

just hopefully they'll get to that point more naturally you can just say right you've got an assignment you've got to do this sustainability because they'll just shove things in, like they'll put a biomass boiler in the basement and link it up to a heat system and say there's my sustainable element but put concentrate on something else

M So even if there is legislation in place that says you know you've got have these sustainable things you think they'll just work around them

PP2 Yeah I think people do get around them I think people, like the government I think the government target is that you put so much insulation into your walls but people only do the minimal requirement because that's what costs effective they never put the walls at say 300mm of insulation because well that's 100mm more than I need what do I need 100mm more, I can get by with 200

PP5 I think legislation should be the last option and then if that is the case then err well the building regs should be tighter, tightly controlled and builders or architects just do what they please

PP1 Yeah I think legislation it takes away from what you were saying earlier with making sustainability more interesting and exciting for them because it's just saying well you have to do this you have to put this in, it doesn't really give the creativity to implement it in these like innovative ways if you just saying this is what you have to do it doesn't let people innovate and come up with these new ideas.

M Ok were just getting on for time so I just quickly move on, I mean we've covered it a little bit it's just going back to education again, how do you think education can help in industry, what have you learned from your programmes that you think would be beneficial to change perceptions and attitudes in industry. So if you say you're all graduating tomorrow and you're off into industry on your new careers what do you think you could go in there and do that you've learnt from your course, I know you're only in first year or whatever, or from like your own personal experience that you think would help to change perceptions

PP5 I think you have to show the worst case scenario of what if we don't then this could happen but I think because if we were freshly educated in sustainability then I think if you design a building it was partly sustainable not fully sustainable and it was successful then maybe a whole practice will take it on

PP1 It's about someone starting the ball off really

M Taking that risk

PP1 Yeah

PP2 If you can put something as simple as I'm interested in sustainability in my projects I think that will get people's attention and also using like modelling software that's

M BIM

PP2 Yeah I think that's a good idea like Revit and Archicad which are two that I use they use modelling software for environmental things and that's a big thing now in the construction industry and the architecture that they want people to be able to show them how to do it because not many people can really, it's more of an education thing that you only learn it when you're in education and you try and adapt it outside and its quite hard

M So when you say if you put I'm interested in sustainability in your projects people would be interested in it, who like clients or

PP2 Yeah I think so yeah if you can show that you've got that basis and that you've got that idea that this is how I'm going to approach architecture I think that's what makes you more interesting, I think that's what sells you rather than somebody saying well I built this tower it, it's got some canter leaving things at the end and it goes this way and that and I think but I think if you can say well I moulded my design and I haven't changed it and it hasn't been corrupted by sustainability, corrupted is the wrong word but it hasn't been changed by sustainability its worked in tandem I think that's more of I think that's what clients are wanting and people are wanting

M So if say people come to you to design something if you've got that embedded in your company ethos you think that that will help promote it amongst say contractors or whoever when they're choosing, I'm not quite sure how the process worked because I'm not, you know

PP2 Oh no usually it's like if you've got a client they'll either approach you as an architect and then you can maybe appoint a builder or an architect will be approached by a contractor working on behalf of the client like a big one is like a university will approach a builder and then they might approach an architect as well.

M But if that's there in your tender say you think that that would help to promote it

PP3 Yes

M That they're the sort of values as a company that you



- PP2 Yeah and if you can show that your building, without say without corrupting your idea of what you wanted but you've somehow managed to meld the two in together if you can show that and say this is what I can do I that's what clients, I think that's what people would like to see, they like to see that you've got an idea that you've stuck with it but that you've somehow been able to merge both of them together
- PP3 It ties in with how the mind works as well so if you an approach a professional architect then if in their portfolio or if their ethos is to be sustainable then you would automatically think well he's an architect he's a professional therefore what's he is promoting sustainability that could that's a good thing then isn't it therefore I should have that in my building that I want to construct
- M Do you think as architects then that you have an important role to play in educating the clients?
- PP5 Yeah
- M Say if they're not very knowledgeable do you think it's important for you to educate them on what sustainable opportunities there are out there
- PP1 They might picture something and we might show them that there's an alternative to that which is sustainable and they might be open to new ideas which they haven't heard of but it's our role I guess to push these ideas forward
- PP2 But you've got to show how it's useful to them, it's always how it's useful to them how they can make the money out of it how they can do something with it and how it will be great for them to have this rather than just sticking to the norm
- M So in that respect then it's important to educate you as students on the technologies and how they are cost-effective and in what ways they can be implemented to be useful to clients
- PP1 Definitely
- PP2 Yeah
- PP3 we've got to become more aware of it to give the knowledge to the client's themselves and therefore we need to be taught properly and given enough knowledge to be able to confidently go out to clients and tell them this is better than, this would suit you better and things like that
- M Just one last quick question, do you think that you have enough sustainability embedded in your modules or do you think there is room for a bit more or do you

think there is too much emphasis on it and it distracts from you know your creativity and getting down to designing your buildings

PP1 I think it's good the amount that they've got because it doesn't really distract away from it because they do them kind of together they really integrate it into the building design and like using passive ventilation or erm just things like that, yeah I think they do really well I think on the course

PP5 Yeah there perhaps could be some like a sustainable specialist who could maybe come in and do the talk but I don't know

PP3 It would be great if you could architect students onto a site

PP1 Oh yeah

PP3 I think that would be amazing if you could actually get them, show them a building and show them how these things are going live there, I think that's how they'll remember it rather than looking at a fixed picture of a building but I think that's a bit too hard now days with health and safety regulations but it's all about just, I think because it's just about getting them interested really, making it so that they think wow I should do this, this should be my agenda

M That initial impact yeah

PP3 Mm

M I think we've covered most things and the hour is up so thank you.

## Focus Group 1 Transcript

M Ok just before we start I'll just explain how the Focus Group works. I've got some sort questions but they're more topic areas that I need to cover but rather than sort of refer to me direct I need you to maybe get a group discussion going and then talk about it amongst yourselves and question each other's views and you know if you don't agree with what somebody says question it and maybe you know put your point of view across and if we just have one person talking at a time so when I listen back to this it makes it easier for me to hear and memorise rather than trying to type two comments at the same time. I think that's it, everything that you say is relevant you know, positive, negative you know don't worry about saying anything, just say it will all go in. I think that's it, is everyone's mobiles off.

I was just going to start by discussing what you understand by sustainability and sustainable development, what your perceptions of it are. What sort of first strings to mind when you hear those words

A: The use of energy but not using fossil fuels, that sort of.

B: Using less energy in what we do cos we still need to create things around us to work, to live

M and what you do, what sort of practices

A: any practice but in the construction industry specifically obviously the energy we use to build and the energy we leave in a building that it uses once we've left

B: using recycled aggregates rather than quarried aggregates so that you're saving digging out further materials from the ground you're just taking what has been used and reusing it rather than that, again sustainable timber, so using FSC is it FSC timber I think where it's from a sustainable plot so for everything that they take down they plant more trees so that there's a sustained growth and it keeps it going through

C: I tend to look at it from more like a three legged stool prospective so I'm not just environmental but also the economic and the social. So here that means what do we do to invest in local communities, employ local people, award local subcontracts. Develop skills, develop people's ability to win work and get jobs in the future

M yeah do any of you sort of incorporate that in to your practice or is it something that you think about when

B: on the North West Construction Hub jobs that I'm working on currently there's a very important KPI that we've got to hit which is localism and we've got to achieve I think between 60 and 70% of local subcontractors and it varies from authority to authority. On my Cheshire West and Chester work it is 30 kilometres from the centre of Chester on my Cheshire East jobs, it's within the Cheshire East boundaries and then you get scored for the subcontractors that you hit within the specific boundary and there's an external boundary where you score slightly less and it's like a sliding scale as you move further out from a particular area and then what we also do is we have on site signing in sheets and we try and get within those subcontractors labour that's local to, and we record how far they're travelling to and from the site and again that's integrated in to a KPI

M yeah to the social side of sustainability, the communities. Anyone else, do you incorporate anything in

D: in my role as Design Manager it's again looking at similar things. You only ever do anything in work if you have to in terms of sustainability unless it saves the company money or anyone money, people will do it and also if they have to do it other than that, if it costs company's people to do certain things budgets are so tight at the moment that they tend to only do what they have to when it becomes, when the economics changes in terms of construction and they're judging people on quality instead of just on costs then it probably has a bigger effect and we can then try to go more for sustainable items because that then gives a better value to the project and the people who are selecting the projects will then get on that rather than just on long term

M and best value overall

D: yeah yeah unfortunately the way it is now people look at the money side obviously straightaway and sustainability will be pushed back in terms of order on importance

M yeah

A: but things like (???) is supposed to change that

D: they are supposed to yeah

A: that's why people are using the construction hub as a vehicle for procurement and not the things that NAME says that, models that we use, structures that we use for social

economic styling are just as important, in theory just as important are the commercial side though aren't they

D: yeah well I think the North West Construction office is probably one of the few vehicles where that's happened. If you go to a private client then I don't think they would ever select you over someone else because of the sustainability side of things

C: we're still doing BREAM buildings though aren't we

D: oh yes well BREAM but that's again is something that's required, clients are requesting it because in terms of saving them money later on in terms of their longer term investment in the building and the working costs

D: ok

M is there a lot of client demand at the moment, is it on the increase or will they only

D: I would say that North West Construction is certainly one of the biggest employment, you know biggest group spending money in the local area so it tends to, but obviously that's linked to the government and the government targets from various sustainable challenges

M yeah well more so there's some differences between the public and the private

D: yeah but if, if the private people can see the benefits of certain things like less energy consumption they will push for that because they can see in those terms. But you see quite often buildings are done by developers who then sell them on and so there's a separate link between them and who actually run the building afterwards. They sell them on to pension funds and things like that and obviously slightly cheaper running costs help sell it as well. So they might, they might try and select something that's reasonable to sell on because they want to give it a certain efficiency but if they actually owned it for the next 25 years they may consider that more important

M so it's about the post occupancy as well as the

D: well again that's changing. The number of people sat here sat in meetings yesterday about government soft landings, which is about how the design and construction stage will stay longer involved and there will be three post occupancy assessments to see how the original design works against the actual. And one of the questions is if the models don't work so it's becoming more essential

M yeah how do you think that's going to impact on your work then, the government's soft landings in terms of when you design?

D: oh it will have a big effect the whole model will have to be understood better. So they will be talking about creating electronic models of the buildings and assessing them for occupancy and how it works but it will mean that the clients will have to understand more about how it works as well because if they just come to the table with we want an office building for 250 people they'll have to know more about well what times is the occupancy going to happen, is it all between eight hours or is it twelve hours in a day, do people come and go at the same time, will the door be opened constantly for half an hour in the morning the heat loss would then have to be calculated. It would be quite a complex change. Whereas at the moment that doesn't happen

A: it's a significant risk for us in business because it means that our responsibilities to the building stays not just for the twelve months with the defects and the infrastructure, the concrete and everything like that, the actual energy use will be measured in a few years' time the overall energy use of a building. What we thought it was going to use and what it actually does use at some point if it doesn't do what we say it was going to we will be at risk to put it right whereas we didn't have those responsibilities before, so it's quite significant for construction companies

M yeah. How on board with it do you think they are, are they ready for it or

B: I'd say commercially it's a big risk at the minute and its, you'd have to look at it, if you came at it from a purely commercial aspect you'd have to price in well what if that fails or what if the heating isn't up to spec in twelve months and it's a lot of what ifs and you're trying to in essence pick an item off a shelf from the air and guess that it might fail and that that it might fail you'll have to price that in which will then, if something was worth £10 million it might be on the tender £15 million because you've got to price in

A: the risk

B: the risk of if the heating goes and you've got a five storey building well how much is it going to cost to rip out the heating and put in a, an on spec new heating system that hits the regulations that you need because that doesn't quite hit what it should be hitting on the model so it brings in a whole new aspect in to how you approach the tender, how you approach the build and then the end cost to the client. And I think that then pushing the initial on outlay for the client at the beginning of the project or

having to keep a significant portion to one side for that project would scare most clients off from that particular avenue of building new offices and building of the like

M sustainability

B: yeah

M sustainably you mean yeah so it costs a huge factor

A: yeah well its risk but there's a cost associated to it

D: the other thing I think is actually selecting materials, you know you talk about the idea of the FSC timber is an obvious way to see how that's rated but there are so many materials in the building that you can ring up and ask a supplier you know where the brick is from and it might be stored in their yard here up in you know but created somewhere else and transported up so it's trying to find out where the origins of some of the materials have actually come from and then putting that against cost and locality and things like that so that what I was saying, if there was some sort of matrix that you could give a scoring to understand how far its travelled. Cos you talk, you talk about carbon rating and all this sort of thing, we don't actually know how much energy's gone in to making that product and it's very difficult to compare the manufacture of a small brick to a steel work

M so again the embodied energy in the building from you know

D: yeah and that's very difficult to understand when you are trying to put together a building in a very short period of time and select materials over what it looks like and then try and source it. So it's not an easy thing to do

Obs: now is that information becoming more available from manufacturers or suppliers or is that something that you're still seeing as a bit of a gap at the moment

D: it's one of those little bits of writing that the bottom on one of the pages, it's not something that they try and sell because if you've got a national company that only builds it in one area of Cornwall for example they're not going to announce that if you are trying to get all of your materials within a 50 mile radius of the job

B: what you've also got as well is a lot of architects and consultancies have ties or not necessarily specific ties but they'll use or prefer certain manufacturers. So what they'll do is when they've drawn their specifications together they'll take specific types of brick because oh well I've used that previously and that, I like that colour and I like the way that looks and not necessarily consider well is it from Dover or is it from wherever

or is it from Exeter. They don't consider if it's from down south, up north, on the west coast, the east coast, it's I like the look of that, it looks aesthetically pleasing

M from a design perspective

B: yeah. So I want that material. And the impact from where it's coming from doesn't come in from the picture. Erm so if you was to try and steer the industry in to a completely sustainable build then its, you've got to try and in my eyes change the views of the consultants as well as us building it because they drive, they drive the initial design and if you want a truly sustainable building then a lot of legwork for me has to be done before those tender documents even hit us as a construction company because you know you could talk about insulation , EGWPO and making sure that and there's loads of little pockets of information that would lead to a more sustainable build but at the minute all that legwork although its done in part isn't done as an import, right it's not high on the importance list, it's more a case of does it look aesthetically pleasing to the project and then that's where it moves through

D: you've got to remember that the client is looking for their end building. They're to be honest not really interested in all the bits about the construction and design, they just generally want it fast cos that's when their money, they've laid out all this money and they've got to start earning off it to put buildings up like this and fill them up. And so they just want it done fast and so the time that it takes to do all this is very difficult to build in to the normal building programmes

M yeah

D: so people tend to as you say use, and we do the same here don't we

A: Yeah

D: we use companies that we've worked with before that have given a good service and we expect them to again rather than exploring maybe some other local labour

M how do you think you would go about changing that, getting industry to view it differently and you know change the mind-set of not going with what they know but taking that risk and moving forward

D: have you done a study of how the industry's changed over the last thirty, forty years

M sorry

D: the industry generally, the construction industry's changed massively in the last forty years from a traditional based architect who would do all the information beforehand,



issue out a bill of quantities and lots of different contractors would then do that. My first job was eight of us working in an architectural office, working on a scheme that was for £1 million the Liverpool School of Architecture extension. And it took 18 months for a team of eight of us to hand draw everything. Do the bills of quantities, details and that then went out and I think it was then 4 months for the contractors to price that up. That job now would be expected to be done by one or two people in probably 16 weeks

M is that because of the technology that they've now got

D: no cos its technology only draws it for you, it doesn't design for you, it just adds more information. It does help certainly because you know the old drawings you had to scratch off and redo to the plan but it's still a question of time. The whole of the project then for £1 million took 18 months on site. That now I would say we'd be looking at 28, 26 weeks to get done so the whole process from the start of design, from client to getting completed building was probably 25 to 30% the time you had 30 years ago

B: you're catching two things though aren't you, you're catching the architect who gets the preferred supply chain partner say

D: yeah

B: to do part of design work so he doesn't have to spend as much fee doing it, he can do it quicker

D: yeah

B: technology does make a massive difference. Email and things like that

D: yeah

B: go back to faxes and it's not quite the same or letters you know, you used to write people letters and expect a reply when we had a query so. The technology, that relation of speed is. Sub-contractors of solutions to build is based on who does the most to help to get the architect along

D: yeah

B: and to answer your question I don't think they would tender, they'd use, they'd carry on using whatever is best for them to help them move along

D: the only way I see it will change is if it becomes a requirement

M legislation

D: yeah

C: well theoretically with Building Information Modelling and I'm going back to what you were saying about the availability of the information. At the moment it's, so for example of Centre Parks we were looking through materials trying to understand how much recycled content there were in the materials that had been specified. All the materials were supposed to come out of the green book but that doesn't account for recycled content. Theoretically if you are using Building Information model where each component has a shed load of information against it including how much carbon there is in it, where you buy it, how much you buy it for

D: how much energy goes in to making it

C: embodied energy goes in to making it that would help you make more informed decisions

A: it would but on a lot of the hub jobs at the minute that are coming through where we are at the minute on the sort of small work side is we're getting about six, six to eight weeks maximum to get drawings made, specification made, price, backing, sent back to the client and then on site. The period that you need to get a fully sustainable design on that just isn't there at the minute on the hub because its, the school say right, the schools that I've been working on got right ok well we want, it's now October, we want a three classroom extension to be ready for next September so there you go, that's the brief. Then it's a case of quickly get it designed, get it in for planning, get it priced and then you're on site in February so you're up against the wall as it were to get the building out, to get it agreed with the client, to get it sorted and like you say the sustainable section or thought processes sort of get pushed towards the back because it's more a case of drive the design, get the client what they want and get them in for that time. Because if we don't deliver the time then we won't get the next job and we won't get the next job and we won't get the next job and then we just won't be able to keep the business running if we don't hit what the client needs. So it's probably, you'd need to try and change the thought processes of the clients and maybe you know your councils, your private builders so that they understand what it is to be sustainable so that then the periods that follow on from then are more in tuned to getting the buildings sustainable and across and how that that protect the environment as well as getting the client what they want

M yeah

- E: that's a fair point that, it is down to only having enough time to do it once isn't it perhaps the only way you could do it is some form of legislation that says for every, you know after tender three bids and packages, well maybe you have to do three designs or you have to do something like that that you can then fully assess to say well actually that's the quickest, that's the longest, that's the cheapest and actually that's the most environmentally sustainable, that's the one we're going for
- B: I think it is slowly changing in terms of education cos I've just been offered, just going in to the fourth year of a construction management course now and I've just been offered two different modules. One of them was off site prefabrication just because the course I'm anticipating change from traditional buildings to more off site stuff where everything's prefabricated with a lot more tolerances so less waste and obviously less carbon and that sort of thing so I think everyone is recognising that its coming round it's just probably slower than what it needs to be but whether that changes I'm not too sure
- M why do you think it is though, is it because the clients aren't asking for it in the time and cost restraints?
- B: I think people will do it to try and save money. For example if you bought solar panels on a house it will give you a return in 25 years but if you're paying £10,000 up front you might not be prepared to make that initial outlay and wait 25 years for the return on it
- D: that's that idea about the developer building a building to sell on to a pension fund, he'll be looking at the immediate return rather than the long term
- B: especially a company in this sort of climate where there's no profit and everyone's struggling, they can't wait 25 years to make any money, they have to make it now or bust really so
- C: I thought what you said about listening before was interesting in that it kind of made me think that each separate in the process of like the decision to build, the business case, the design, the construction it's always a series of trade-offs location, localism, how much money you've got available, environmental considerations and that people have different priorities and so that constantly the trade-offs you know it's not the same on every project that you'd say well I'd always pick environmentalism above everything else because it's a constantly moving feast if you like. And what's important

to one person at one time will be different to the same person at different, same person at different time depending on all of those considerations

B: but coming from a commercial side and dealing with the hub I'd disagree with that completely because at the minute we're putting a, we're putting in a bid, in bids and the client does their own budget and our bids are between 10 and 20% above and it's the clients perception of well I believe it's worth this when actually they don't really know what the value of the project is. We come in with a figures, 10, 20. 30% above where they believe the value is and they go no it's too expensive we need it cheaper. And to get it on site and get the project going you need to bring the cost down and to bring the cost down you look at ways. And is like well ok well that material's cheaper, that material's cheaper, that material's cheaper not and you don't look at the sustainability of the material you just look at the cost of the material to bring that price down so that the client's happy at saying there you go there's the there's the there's the contract please go and build it for me

C: yeah no I agree with you so there's always time cost, there's considerations and that for your clients at this moment in time they're much higher priority than environmental considerations

B: I think a lot of the cost savings things are subconscious, for example if we was to take a look at waste to landfill now we would know it would cost X amount of £'s but if we're prepared to recycle the waste we're doing that as a, we're saving money on that but is also subconscious thing that kind of slips in for example if you said to somebody 25 years ago you'll have four bins in your back garden and you'll be recycling paper in one and glass in the other they'd look at you like you was mad but it's just kind of slipped in under the radar and nobody's noticed its happened but is has and I think it's the same

F: my kids automatically sort things out like that whereas certainly mum and dad's generation it's not even considered

B: I think there's a different perception in age groups as well like the older generation are more traditional brick and block and different sort of construction technologies will have a different view to someone fresh out of uni or fresh out of college or whatever it is they do

M as a student are you learning about sustainability on your course

B: yeah but again it's kind of filtered across the board rather than say for example one specific module

M yeah

B: it's kind of filtered in to everything

M I'm just wondering now your graduates so you know when you come and work in to a company and you know you know all this knowledge about sustainability but they don't how you think cos from what I've research industry is very resistant in a certain mind-set and it's an intergenerational thing what you've just brought up then so say graduates coming in to industry and maybe trying to change it to be more sustainable do you think

B: I think it depends on what you come in to for example if I don't think I'd be able to have much of an influence because I'm not the architect, I'm not specifying what's been used. If it was a design and build job you might look at the job and say oh you could use that, save money, its more sustainable but you wouldn't necessarily pick the materials or decide what you was actually using you just have an overall influence on how it was built and that sort of. I think it needs a bit more from the designers and the actual people that are building than actually designing the building rather than the people who are doing the operational side of the building

M right ok. So design sustainable practices in to it and factor out waste etc. You think it's a design responsibility

B: well it's probably across the board but it also, I wouldn't expect somebody say a site manager for example to do that. It would be more the designers and the project manager or whoever it is that's looking at the job in the first place to say that might be £10,000 more expensive but in the long run we might save £20,000 out of it. But again that's, I think it depends on what, how long the duration of the job is and how long you're involved cos if you're only involved for 12 months you're not going to be as a contractor interested what the end user saves in 25 years because it's not your, it's not your remit to decide that if they've not specified that you're not going to necessarily say you can save £20,000 now but if you pay is £10,000 extra because it just looks like we're trying to make more money out of it

D: that is what government Soft Landings is about

A: I was about to say the same thing yeah, that's what it's about

D: the government are bringing in these recommendations on how you've got to argue about what you put in to the building now, what it might save over the in 25 years or so

A: right

D: they've put an argument together that for each £1 that you spend on construction now it costs £5 to maintain and manage and manage that building, but it costs £200 for every person that's working in that building so you know if it cost £1 million to build it would be £200 million pounds to cover the cost of people working in there and £5 million to cover the maintenance

A: Umm

D: so if you put something in now that's £20,000 more you could be saving £40, 50, 60 thousand out of the £5 million budget that it would cost to run it

A: yeah

D: so that's what they want to see that argument but it's going to be quite. It means the model, the BIM model will have to be more and more accurate and the understanding of how it's used with will be more important. And there you can start to then show there's savings on energy or replacement of materials on a floor for example over the 25, 30 years

E: and that means better integration with Facilities Managers and end users during, during the design process and through the construction process as well

D: I've talked about having people who are in Facilities Management now being involved at an earlier stage to say well you know this type of carpet wears out after two years whereas we've got one in there that's lasted 20, can't we have a look at that. It might be twice as much but if it lasts five times as long then its better value

E: yeah

D: so the construction costs may actually go up initially but to give a better value in the longer term

OBS: have you seen any movement from clients towards that kind of whole life cost approach

D: it was involved in the PFI to some extent cos PFI had a separate funding stream which they continued to look after it so the FM people got involved with the construction at an earlier stage and it did yeah it had one or two influences on material finishes and

the way the buildings operated probably went up more because it became a lot more mechanically controlled in terms of if schools didn't open the windows they were opened by a machine because they said it was too hot. And that could be controlled from anywhere in the UK. So you'd have someone sat at a central control which had like 50 schools to look after. And they could see from their screens what was going on in all the schools at any one time and they picked up if it was overheating or it was short of oxygen and they would open the windows automatically. That was fine for controlling energy and everything else, the schools hated it because they couldn't work out if they could open a window if they were hot

E: no, no control

D: yeah and they didn't like losing that control so people now want to go back to just opening windows, let the energy out, they don't turn the heating down, they just open the windows cos they're too hot

B: yeah. I know it might be slightly going off topic but if that's the way everyone is being forced to go where you're going in to the same sort of PFI route where you're maintaining the building in that sort of situation will that not just give the likes of COMPANY NAME and everyone a chance to run riot and win every job that's

D: yeah well that's a, I think PFI is going again, fairly limited again but that's how it was 14 years ago and you know their PFI route is costing a fortune to keep the buildings because of the rates were so high

B: because a company like us that when we're doing the traditional 12 month defects we're not going to be able to convince a client that we can do something for 25 years when we've not done it were the likes of COMPANY NAME have been doing PFI jobs for years and years and maintaining hospitals and that sort of

D: if you speak to any of them I don't think they'd want them again

B: I think that business needs to understand how they've managed, again going back to that risk again though doesn't it. Answering your question again though I think in the last, you might be able to correct me in the time that you've been here but I've only seen, certainly in the last year or two one question on a bid that's been relating to lifecycle costing

E: right

B: maybe two. So even through the construction hub jobs it's not a regular question yet

E: no

B: but there are, we have done one or two private sector tenders where the client has said you know what are you doing about lifecycle costing in your design process

E: right

B: because they're going to be the owner operator of that building

B: because they obviously knew that was coming yeah

E: yeah

B: but it will start to be more of a significant question I think in the future the model they are

D: but it won't be because if they want a green building or anything they will want it because it's cheaper to run

B: yeah

D: and that's the driver

E: again it comes back to cost from their point of view and behaviour from your point of view is driven by the client's requirements

B: yeah

E: yeah ok

B: it goes back to the costs thing again doesn't it, they're actually changing direction from cost up front to cost to run at the end, it still might not be the most sustainable. It might be an element of the most sustainable construction methodology but are we now moving it to is the be all and end all of what it costs to run it

M yeah

B: that's probably where it is but there's still an offset to

A: it's going to be a happy medium of both isn't it. You've got to, the initial outlay married with the facilities management of it

B: ok

A: and there's going to have to be probably be a model driven that says well on initial outlay if you spend loads and loads and loads up to a point how does that affect the running costs and is there a point where the balance tips where no matter how much you spend early doors it's not really going to affect how much the building costs to maintain and run

B: yes you're right



A: upon completion of the construction

B: yeah but that might not be necessarily the best thing with digging out the ground

A: no

B: you know that's the other, maybe the three stool thing you know it's the same point on the score but the other thing could be the most, best cost-effective method of it might be using brick that we have to mine from Cheshire somewhere that actually isn't the best for the world or oil from fracking or something like that that's not actually the best thing for the planet but it's the most cost-effective for someone who's running a building for 25 years

A: and over those 25 years the carbon footprint would be less even though the initial

B: but how do you measure the carbon footprint of digging up the planet

D: which comes back to my scoring method

A: it does

Obs: I wouldn't have a clue how to start that

A: it's a minefield

D: and you'll find manufacturers will come in and they'll tell you about their green ecology best thing ever but they'll be something in there that probably completely counter products that argument and you're just not aware of it

E: yeah it's kind of selective information

D: it is

E: I had a meeting this morning with a guy who is doing asset inspection and a great company whose sustainability record looks fantastic but from inside the facility their performance is absolutely dreadful. So it's what you, it's the information that's out there, what people tell you is different from what actually happens

B: yeah

OBS: and I think it's really interesting that you're saying that is one is access to information

G: is there any point in me coming in now or not

C: what time is it?

A: we're well over

C: I think you might be let off the hook

E: it's having one, going back to the point we made before about having access to that information and being able to put your hands on the data that we talked about but

also there's a trust element and I think you know you kind of touched on it with what you were saying as well. Can you trust the information that you're given and be able to make that balanced view in order to say we have chosen or we have made a selection on the basis of the most sustainable option available to us?

D: yeah

M yeah. Where does your information about sustainability and sustainable development come from then, just government legislation, regulations that come in or from what clients tell you ISG has come out. I know you're the same sustainability manager but do you provide training packages and

D: what, what are we training for in terms of sustainability. Is it

M on how they can be embedded in projects and maybe how to inform clients. Do you get anything about sustainability in the company or is it just what you learn that drifts in from government

D: I would say a lot of it is you're required to do lots of things and you try and do the best in that. BREEAM is probably a good example. Well BREEAM I would say it's not a simple process again and people just pick up points which are the easiest and I will quite often hear hitting the first like 60/70 marks is relatively easy but to pick up going from a good to excellent you're looking at £20,000, £30,000 per point it costs to pick that up and people don't want to pay when it gets to a certain because you just hit the point and you're not benefitting the building greatly, so that's you know you try, but if it comes at a cost which is just to get the points it doesn't benefit, what, why should you do it. So that's quite difficult to understand

E: yes unless it's specified and paid for and some clients may well go that extra mile to try and achieve a certain standards to be able to go out in to the wild world and say look at our BREEAM outstanding building

D: yeah

E: but otherwise it's not just going to happen for the sake of it

D: no unless, unless someone pays for it, it won't happen will it. And that, that's a difficult one to do

B: like you've just mentioned as well about somebody offering a building saying its BREEAM outstanding again it relates back to cost because people using the building won't have to spend as much to run it so they're obviously prepared to take the initial

outlay to sell the floor in the office or whatever it may be that they might have struggled with in the first place so

A: to go back to the point you were saying on training for me, I've been in the industry now for about ten or twelve years and there's no, there's been no formal full proper sustainability training is sort of been pay to pay knowledge passed on, oh you've got a BREEAM job. Oh have you used GWPO insulation. Have you used FSC timber? Whilst you're building the job have you had a shower? Have you had rainwater collection? Have you had solar panels and its more pay to pay whilst you're working on a project and then you take that knowledge on to your next job with you and then if somebody else on your next project doesn't know then you pass that knowledge on to them and the likes of the design managers who have had experience in other facets of the industry coming in to the company bringing their knowledge from outside in. That's really how the knowledge gets conveyed, there's no in my eyes specific sustainability right you need to go on this sustainability course to look at cost, you need to do this to go and look at social and so on and so forth. It's more as I said pay to pay oh you need to do this or you need to think about that. And that's sort of how it's happened with myself

M is that the same for all of you or

D: if there was a sustainability under building regs that you had to achieve you would then be able to mark yourself down and against that and it would be targeted a lot easier.

E: yeah

D: the fact is it's embedded in little bits and pieces in terms of energy management you know

E: I suppose the closest you've got and you mentioned there is probably part L

D: yeah

E: but that's very much kind of designing to a standard

B: it's complying with

E: it is its complying with building regs say that's what you're U value has got to be for that particular element

D: you can swap it around a bit

E: yeah

D: but it doesn't say how you do it

E: no it doesn't, no it doesn't so in one respect its quite, it's a good piece of regulation in that it allows the market to decide the best and most efficient way of doing it

D: yeah

E: which I think from your point of view Michelle means there isn't a prescriptive way to be able to roll out to the industry to be able to say, all you can do,

M yeah

E: all you can do is set the outcomes and let the industry decide what's the best way to achieve that outcome

M it's so fragmented and so many different players isn't there, when you're all doing separate jobs it's hard to have one document for all say

C: we have done environmental awareness training at Centre Parks but that was quite specific to meeting the needs of that projects

M yeah

C: and only the environmental bit not the whole sustainable agenda

E: sorry go on

A: I was going to say you've got British standards for almost everything within the industry you know perhaps the vehicle might be is there a British standard for sustainability of a building. And if there's a, like you were saying before specific guidance of to be sustainable you need to be X,Y and Z then when you are putting a building design together you've got that X,Y and Z to incorporate in to the design and then everybody's playing on an even field. And you know you might have a fully sustainable company here but these might be just looking at costs. But if you send the tender out and say this is the document you need to price and it is these standards and there is a standard for sustainability in there then everybody will be pricing the same thing and you'll have a true representation across the board in every tender as to what, what's required

C: there's a British standard for sustainable procurements but we don't tend to use it

H: I know

B: because of costs

H: I don't know

A: the client doesn't request it

C: it tends to, the companies that have it tend to be materials

B: which are

C: materials

A: like Hansons concrete

C: yeah

A: aggregates and things like that

B: well then what you could do is put a British standard on a product and like the green guide you could specify at the start that we're only going to use green guide rated triple A or A plus products on this job. There you go and then everyone has to do the same then every single product that goes

A: sustainable

B: sustainable that an option then

E: that happened on COMPANY NAME, well it was supposed to happen on COMPANY NAME

B: what was?

E: that using the green guide highly rated materials and they, COMPANY NAME had this grand sustainability strategy and I went and did the training on site with the guys and the approach was fragmented to say the least. It wasn't

D: is that because you couldn't get all the products that were rated like that or

E: nobody was driving it as far as I could see from the client's point of view. So they had this strategy saying this is what we want to do and COMPANY NAME were awarded the contract to build the chalets and it just, it's not I don't think it's no criticism of COMPANY NAME but it's just not been driven down the supply chain. There were some good things happening from when we did the course and lots of people kind of turned around and said oh yeah we're using 10% recycled content in these plastic drain covers but it wasn't driven by anything coming down from the client. And that project was very much driven by very strict time deadline wasn't it

C: well for all we know everything that was specified was in the green guide but I think the information never made the leap from the designers

E: yeah

C: to us doing the construction

E: yeah

C: and then when we were trying to backtrack to understand you know what was being used in the supply chain, yeah we certainly weren't linking driving that down

M so there was a lack of communication

C: yeah

D: it's traditional that you seem to have a gap between certain stages as it gets passed on and again this was all in the meeting yesterday wasn't it that part

M you think there should be greater collaboration between the parties then, a better sort of

D: well they're talking about BIM – which is Building Information Modelling

M everything's out there for you

D: and on that it records all the information so that when that starts to come in from the manufacturers and it has the, all the guidance on it, it will be attached to the model that goes through will it so anyone can interrogate the model and understand maybe why certain things were selected

M do you think private clients or people who procure private jobs will use that as much as public because it's something that the government's mandating but it's for all public projects isn't it

D: I think it will probably follow that everyone will end up using BIM for every model

B: it's a government project at the minute but it will be manager won't it sooner or later

D: I just think

B: you did say, you did say didn't you

F: 2015

B: yeah 16 something like that so yeah it'll become a. Probably what we were just talking about the courses whose going to manage it so yeah it will become managing

M for everybody

B: for everybody yeah

D: I've been involved in a project which has all the three main trades of mechanical, electrical and structural and architectural working on one model with clash detection, worked brilliantly. If by choice I would keep working like that constantly and I think once people are trained because there's probably only 5% of architectural staff out there who are probably capable of working with BIM, so once that builds up to 50/60 and then all the youngsters coming out of college will have that skill, it will change

B: well it will...won't it

D: wish I had done,

A: I think it's like anything, I think a lot of people are scared of doing things aren't they cos it's not something that they're used to. Whereas if you've got 30 years' experience of doing something and you're told overnight you've got to learn something else haven't you. People aren't going to be prepared to spend another two or three years

D: well we've done it this way for years why do we have to change

M how do you think we can change that mind-set? That's sort of the crux of this

F: bringing in new blood

A: well I think the old guard will stay as the old guard always. And they'll always know best irrespective of whether you can prove them right if they're wrong they'll consider themselves to be right. And you'll, you're fighting an uphill struggle to convince

D: there was one person sat in that 120 architects office that had a drawing board, the other 119 had computers and he just wouldn't entertain

B: the way forward is getting people like NAME or people who are on education courses taught or built environment courses, construction courses, taught about things like BIM. It's got to be the only way hasn't it. Come out so they can sit at a computer and open up the relevant page and put the information in, take the information out and understand what it means

D: it will happen. AUTOCAD exactly the same effect. I started on AUTOCAD in '87 and there was 5 people in the office and 60 that had it within 5 years there was only two people that didn't, so it did change. And once they can see the benefit people will move to it but it does, there is an inertia for people to move forward

A: I think if it was proven people, and there was some sort of incentive that the older people that are already involved in it then it might be something they'd look at but if there was no sort of incentive and you've still got the same outcome at the end of the projects why would they change them when they already know what they are doing and it works. But if it as Nick was saying, if it's something you're taught as you coming through that would be something that you know but at whatever stage you're going to be I could be sat here in forty years' time and say you know BIMs out of date and I'd be saying oh no its not its good but somebody's trying to change my perception of the situation

M yes

A: is

M always changing. At the minute then, it brings me on to some of the last topic I need to cover that how do you think education can help industry. I know we've got sort of new graduates coming in but how do you think education can help, maybe come into industry from my prospective designing this model to sort of pilot with the students and then I'm going to try and bring it in to industry, I don't know what it is yet, this is why I've got all you guys together to try and inform what I do

D: what how sustainability issues

M yeah. Or just sort of change their mind-set and come in with sort of a model that tries to educate industry on sustainability

B: you could probably so it in schools, and you'd have to do it as early as possible really but again its doing it in schools you'd have to justify to, you'd be like creating a new lesson, you'd have to justify the cost of it all but if you filtered it in to slowly just kind of again filtered it in so it's not a standalone module type thing. But I thought, I think if you try as I say you've got to go and do an hour a week on sustainability, you'd have to obviously justify that to people otherwise they say why but if you filtered it across the board over different courses and different sort of lessons you might get away with it more that way

M do you think building it in to CPD would work then do you think

D: no I was going to say are we talking about sustainability across the board or are we talking about it in the built environment

M the built environment

D: so it would be students

M itself yeah

D: so students within the university all learning the course on building is obviously the first to look at isn't it

M yeah well they're all getting that education but industry's not you see

D: yeah

M so they're graduates are coming in and coming in to a very resistant mind-set you know it's the intergenerational thing

D: no I think it's down to whether they're, industry have to do



M so you don't think education can help industry

D: it will certainly help but even if you taught everyone about sustainability it's like I don't know, going shopping in the high street you can have a plastic bag to carry your stuff and you can have a big cardboard one, it's a shop's choice to try and sell their products isn't it, it's how the construction industry says to do things. No it's how you sell the construction as a whole, they'll be architects who push the green and sustainability then there'll be clients who are prepared to pay for it. Once those buildings start to get accepted and they're not seen as being more expensive then it will be acceptable to keep moving in that direction I think

M yeah

D: but it will all be about the

C: I think the important point is that it's not just about educating the kind of the construction management students, it doesn't matter how green James is if the business, if this business is run along the lines that meets clients requirements and clients don't demand it

M is that the bottom line

E: I think if you ask the industry generally they would say if we were asked to do it we would do it and the industry would respond, the industry is responsible

D: they respond to what the client wants

E: yeah

D: that's, and if you give, and if you give them more for the same price then they'll be quite happy to take it but most companies can't really do that. So we'll try and be green as much as we can but if it starts to cost more money and that goes to the client then the client says well we're going down the road it's cheaper down there. And that's the same with all of the trades involved in putting a building together

C: so for me it's about educating everybody

D: yeah

C: whether they're training to be, you know school teachers or caterers or economists or you know so that everybody's behaviour changes including client behaviour

B: that's what I was trying to say about

C: not just changing our behaviour

B: getting it a right school sort of level to it becomes natural then and whatever sort of job you go in to cos you won't just get it in construction, you'd have to get it across everything to make a real sort of difference because, it just wouldn't work doing it in construction alone I don't think

M Ok

C: so a big remit for you

M I know, change the whole world

C: crack on

A: today the construction industry tomorrow the world

M yeah it's a valid point what I'm just trying to sort of see where I can go with my PhD with this and maybe what it is that I can come in to industry and do. You know should there be more collaboration between industry and university as you think so we can impart our knowledge what the students are getting

D: we get CPD seminars from manufacturers who sell their strengths. It's very rare that you get someone coming out who's completely independent, who can try and identify what those strengths and weaknesses are amongst the products out there. Ultimately I don't, if there was two products the same price, one offers

M it's going to be

D: you know a green solution, there would probably be the option to take that but until it comes down to anything else I think it will mostly be cost driven

M cost and the legislation

D: legislation is absolutely the key one and the idea of this North West Construction Hub wanting people and suppliers from the local areas is certainly having an influence in terms of that end

M the social element

D: yeah

M how sort of, I'll scoot back to the first point, are you aware of the social, economic and environment, obviously the environmental is probably more but the economic and the social dimensions of sustainability

A: on that again something we said earlier was on, on the sites we're trying to drive local labour as well as local sub-contractors within 30 kilometres, and you try and get the local labour. Whenever we go to and get a labourer for general site clearing we try

and get a labourer that's local to the area that fits the needs of the business. We also are trying to, where we can, is in some of the prestart meeting minutes on meetings that I've had of asking the various sub-contractors do they have any apprentices on their books. If so can you bring those apprentices on to the project so again it's that social aspect of giving the younger generation somewhere to learn and somewhere to apply their trade that they can go.

M yeah

A: and be an electrician, a plumber, a joiner, a bricklayer

M do any of you find that on your projects or

B: well the times I've had on all of them, it again it's ticking

M boxes

B: yeah unfortunate phrase but it's to tick a box because it's a requirement. But that's where probably the education opportunity to come is that we've to up skill young people so that they are aware you know the young male electricians are coming through the young bricklayers and plasterers that they understand where the materials comes from, the type of material it is things like that at an early age

M do you think there are any other barriers apart from cost and, that prevents industry adopting sustainable practices, is it just cost and client demand

B: I think they're probably the main two

D: generators aren't they

M yeah. But do you think there's any incentives that would maybe help industry to offer a sustainable apart from legislation you know, course yeah. Any other incentives that you think may help. Rewards rather than penalisation

A: what rewards sort of like government grants so maybe if you hit certain sustainable targets you get a certain figure back as a rebate from the government for creating a sustainable built building. Its I don't know, I'm just

M yeah. How do you think that would drive forward client demand?

D: in a. Sorry, going back in a way I suppose the idea of bringing on apprentices is ticking the boxes so you get the opportunity to bid on your next lot of work because that adds value to your next bid. So I suppose that in a way is the incentive to make sure you hit certain targets because you then get the opportunity with the next

B: do you do that though

D: no, no but that's what. That's the only thing I can think. I mean unless you start getting financial return for doing certain things

B: no, no, it's not necessarily a financial incentive is it, it's a financial disincentive if you don't do it that's you know

D: yeah

B: you won't get work so it's easier to say yeah you know for every apprentice we take on is £500 oh right yeah great but it won't work like that and if it's the other way around and you don't take apprentices on then you lose the whole. And then the greater financial incentive to us to lose something like the hub would be significant so

A: I know it's still an indirect relation to cost but if for example contractors are trying to get experience of working in that sort of thing say when a job comes up say in ten years' time that could be like £100 million specialist sustainable development project, if the contractor doesn't get in the working bits and bobs here and there I know it's still trying to win the work but if they've got that experience it's still a bit of an incentive to do that sort of thing

M yeah

A: I suppose it's if people are willing to do it for the cost

M just one last question. Who do you think should drive forward sustainability, government or industry or both? Who do you think more?

D: the most influence would put the government

A: I think the industry's probably got a bit to do with it because I think construction's like the worst industry for carbon and its, I know it's been like heavily attacked, well not attacked but probably sort of

B: criticised

A: criticised that's the word for it

M yeah

A: and I think construction's probably had the biggest like targets set for it by government so obviously it's the government to implement the control but contractors and designers have got to do something to try and meet the targets that they've set so

M do you all agree with that or

B: government's got the strongest power hasn't it but the private sector I guess has got to follow to keep up with that haven't they. Way that the construction industry can beat it or not, I'm not sure

A: I think now the construction industry generally takes its lead from legislation doesn't it and it doesn't change unless legislation changes and to drive sustainability you're going to have to drive sustainability legislation to force the industry to change because yeah the industry will change but it might change over five, ten, fifteen years. If legislations brought in its going to have to change in five years and there'll be a specific deadline you must change by, bang that date otherwise it will be a case of oh well we'll try and meet

D: lip service won't it

A: yeah. We'll say you know we'll try and meet what you want and we'll get in to the project site and say yeah but we can't quite do it that way so we've got to do it this way which isn't a sustainable way of doing it because and there'll be a million and one excuses as to why it can't be sustainable as the guidance says if there's specific legislation you will do it Bang, then if you don't hit it then you've got nowhere to go, it's like right ok well if I don't hit it do I get penalised, does this happen, does that happen. But until that's sort of like battened down the industry will just sweep along and gradually take in the change but nothing hard and fast will be sorted I don't think until its done

B: I suppose the only other thing you could do is if, if you were in the same position now in ten years' time having had ten years' worth of schooling, of education you might not even think twice about using the none sustainable products. Going back to the point you know when you did it nearly thirty years no one even think. You know the choices of sustainable products might not be a non-sustainable product full stop but actually your mind always says well I'm not really bothered about cost I'm just going to go with that one

A: going back to the legislation thing is, it might be a bit of a cheesy analogy but if you're driving it might be safer to drive at ten miles an hour but the speed limit's thirty miles an hour so unless they change it down to ten miles an hour you're not going to do it are you

M yeah true

E: you're asking now

B: my car won't go that slow

A: I've only got a 1.2

M I think that wraps it up then thank you. It was very informative thank you

B: no problem

D: so you've just got to go off now and figure out this big spreadsheet

A: this model, yeah, yeah you've just got to create a model now

B: so where does your drive behind all this come from, what's your driver behind it?

M doing my PhD do you mean

B: yeah your subject and what brought you to this subject

M Well I did psychology so that's where they brought me in to try and get what we know from psychology to change the attitudes in industry so I've looked at emotional intelligence and I developed a questionnaire to measure attitudes towards sustainable developments because we didn't have a questionnaire that quantifies it so then I could measure it against emotional intelligence and see if there's a relationship between the two. So those I've found to a higher emotional intelligence have more positive attitudes towards sustainable development. So maybe it's more sort of being emotionally attached to the environment or sort of differing factors that I'm starting to look at now

B: what do you mean by emotional intelligence?

M it's sort of how aware of your emotions you are and those of others and how you're able to sort of manage and facilitate them in environments like this but you do it subconsciously

B: right

M so it's sort of big in the leadership literature as well you know being able to manage people and

B: so not necessarily educational intelligence

M well it's huge in education because they've found that emotionally intelligent students do better academically and with their peers over and above general IQ. If you've got, cos especially in university if you've got a higher emotional intelligence you're more likely to engage with other students and that makes you stay at university longer than more so than drop out and emotional, it's becoming a big thing across the board so

I'm trying to tie it in with sustainable development now yeah. But it's not really been used before so it's all new so I'm just sort of now yeah finding where it sits sort of thing and can we use it in maybe training packages

B: right, have you actually looked

M yeah

B: so have you actually looked at the amount of education content in perhaps, I don't know junior, senior school whatever. Is there any sustainable education going on, is there looking for that development like

M yeah well I haven't done that but my supervisor and another PhD student they integrated a curriculum model in to John Moores University and they sort of researched it across the board and it is being integrated especially in universities now a lot of the building courses, built environment courses

B: yeah

M have a sustainability module but its, its where do you fit it in you know what do you take out to squeeze that in and again it's just a

A: that's what I was saying you'd have to

M it a complex subject

A: to do it you'd have to filter it across the board rather than get rid of something to

M yeah its where universities are going to slip it in to their curriculum now you know what do they take out and what do they lose if they're educating people on this rather than something else, there's only so much time isn't there

A: but does it not come before universities though. Does it not filter down because a lot of college courses now are going vocational?

M Yeah

A: rather than exam

B: that's where it's hard to

A: and that, so that's vocational courses because whether you be a caterer and builder, I know it's sort of going off from the built environment but you know if you're a caterer where does my flour come from

B: yeah

A: where do the eggs come from? Do they come from the local farm you know? It filters in to catering as well as all through

M oh yeah

A: so perhaps it's sort of, further education is a great vehicle but perhaps it's sort of the age bracket to start challenging it to is maybe 16 to 18 year olds before, whilst they're just out of school, they're still wet behind the ears, they're still like a sponge soaking up everything that's around them

M yeah, no offence, you absorb more less

A: you know what I mean though

B: that's a good one. We're producing a kitchen, this is a project in Liverpool and speaking to the kitchen designer there's still an inherent issue with chefs, call them what you want. they go in turn the ovens on first thing in the morning because that's what they've done for the last 5/10 years and now with new electric ovens, electric cooking, induction cooking and stuff like that you don't need to do that anymore so the cost of running a kitchen, a sort of industry standard kitchen is substantially lower than it used to be. So there are other elements, not just us putting a building up

M yeah yeah

B: you know our consultants, the consultants we work with on M&E basis they're entrenched in doing everything, it's sort of weird in a way cos they're, their design philosophy used to be loads of air conditioning, loads of heating, loads of this that and the other. They're trying to design out their own services but they're doing it because of the environment and because that's

A: the rules

M yeah this is focusing on just construction, just because as you said before of the impact it has, it's got a, it has a huge massive impact on especially from the environmental side

D: it's a massive part of the

C: we could send everybody here your questionnaire couldn't we?

M yeah

C: is that not

M I did bring a few with me but I was conscious of time but I can email it to you or. I think if you go on the Bristol online link its, psychologically it looks, it's about this long, cos its two questionnaires and its created in to one and everyone just goes oh I'm not filling that in so I'll send the Word document I've got, but yeah it's the emotional



intelligence questionnaire which you can measure and I can give you your scores back and let you know how emotionally intelligent you are

D: I'd like to be intelligent at something

B: yeah I'd go along with that

M and just the sustainable development one which measures your attitude towards it. That would be great thank you

D: just thinking about eco, my daughter's an eco-councillor at the age of nine so it is coming in to

M yeah they are starting to do a lot in schools I saw something on the BBC News the other day that you know the children think that fish fingers are made of chicken apparently so with schools educating them on and they've got a little gardens in lessons and they go in and make their own dinner and they educate them on where it's from and

OBS: it is you know in to the national curriculum

M oh is it

E: yeah it is

M oh ok

E: yeah I've got two school aged children

A: a lot of primary schools have allotments as well and things where they go and

M so maybe we'll get there just not for my PhD, I'll have a good go

D: the food analogy is probably a good one cos organic food is now getting a bigger and bigger part of the shelf life in the supermarkets isn't it

M yeah

D: and people, some people are prepared to pay that extra for it there's organic markets to go to which a becoming

M Yeah

D: more local produce

M so we need organic buildings

A: free range chickens rather than corn fed chickens now just cos ten, fifteen years ago there was only one type of chicken and you got it off the shelf and then there was like well you're not being sustainable to the chicken by forcing a tube down the throat, forcing them full of hormones but

B: that's not chickens

A: but keeping.

C: turkeys

A: oh sorry is that turkey's well you know what I mean

B: oh yeah

A: and now its let them run around and you know and exercise and stuff and

D: and you're more informed so you can make a choice

M so we need to inform the clients isn't it but it's how do you do that without, cos you don't know who your client is until the come to you so you can't. It's about educating everybody at the end of the day isn't it

D: yeah

M well thank you

C: thank you

M and I'll email you those questionnaires over, it takes about ten, fifteen minutes. Cheers  
thank you

## Focus Group 2 Transcript

MB. Right ok it's recording, can I just get everyone to take one of these and if whilst people are talking if there is anything that you think of just sort of an extra analyses tool for me any notes or points that you think of and I can use them as well

PP1 Are these for you?

MB Yeah. Just whilst someone is talking if there is anything that you think of and you know you don't get to say in the discussion just to sort of write down any extra comments that you might have. I'm just going to start by doing a little task sort of if you start to write down on here what you understand by the terms sustainable development or sustainability, what it means to you when you think of those words. And then if we have a little 5 minute discussion around that and see if there is a consensus and if everyone agrees or if people have different views of what sustainable development is.

PP1 sustainable development?

MB Yeah

PP1 Ok

PP2 Is it the same as sustainability?

MB Yeah if we just use the two terms interchangeably

PP3 Oh that's very good James, you you've that's very good

PP1 Wo wo no copying

PP1 He was reading up just before

PP3 He's been reading up he has, he has definitely

PP4 James is just xxx hot

PP3 that's what it is

PP5 Shut up

PP1 what are you complaining about

PP3 Nothing

PP4 It's the same as James

PP3 It's exactly the same

MB Can I ask what you have all put then?

PP3 Ah do we have to read it out? For a building or a product not to create more damage to the environment in its lifetime and it should also be designed to incorporate sociability and enhance the local community.

MB Ok anyone else

PP3 Whereby development method seeks to reduce impact on the environment

PP5 The ability of today's generation to meet their needs without jeopardising the ability of future generations to meet their own needs

MB Ah the Brundtland report, definition

PP5 ha ha I remember that somehow I remember that from somewhere

PP3 yeah

PP5 out of some text book or something

MB What do you have Estelle?

PP2 I have key words

MB Ah ok so you have key words that ok what have you got?

PP2 Economies, social and environmental

MB So the 3 pillars what it incorporates, ok

PP2 yeah

PP4 I've done the same I've just put things that came into my head when I thought about sustainability. The first thing was roofers then I managed a point around traceability erm and thinking about materials and where they are from

MB Ok is there anything else that you can think of or they the main things? Are you all aware of the 3 pillars, the social the economic and the environmental impacts? More so the environmental or?

PP1 Yeah

PP3 Roughly yeah I've got social but

MB Ok what would you say has informed your perceptions of that, where did you get that information from

PP3 I've actually read somebody else's dissertation on the definition of sustainable development

MB OK

PP3 So that's how I knew

MB Anyone else, is there anything that you do in your work practices that involves

PP4 I studied it at uni

MB Ah ok you study it at the moment?

PP4 No I've finished uni some time ago

MB Does anything cross over into your everyday work practice about sustainability

PP4 Not really it's too expensive

PP5 Yeah I've looked at it for professional development you know, you need to know about sustainability so I just read up on it myself and what's in the industry you know journals and stuff like that

MB Do any of you, does anyone else read up in it or

PP1 Yeah I'm supposed to, we are supposed to build in carbon costing into jobs soon, how soon I don't know because it's also part of the BIM and all that stuff that's coming in, so I'm supposed to be reading it but

MB But you don't do it at the minute because it's not come into practice yet?

PP4 The problem with sustainability is in order to make it a sustainable product there is a cost implication to it

PP5 Yeah

PP4 And the end client won't pay for it and the only reason, the only way it will change is of legislation changes to force hands or the industries perception of it changes, if that doesn't happen we will never see it at the mucky end of the stick because they will always go for cheapest. We try to bring it in I mean we use recycled products wherever possible, we try to minimise any impact that we are going to have on it but ultimately we can't achieve 100% sustainability until the clients want to pay for it and they're not

PP1 but the industry is going to be inclined to change its way in 2016 anyway when

PP4 it will only change its way when legislation changes

PP3 That's when BIM comes in

PP1 Carbon costing will have to be encompassed in some products I don't know about our industry but certainly

PP4 Is this the thing that Roger was hanging his hat on for the system first that was meant to come out 3 years ago and got put back

PP1 2016 I don't know, erm I know with, I think its stuff to do with projects or for certain costs have to build in a carbon cost into, so you can't just say that this will cost 2million, say

somebody might have a project that's more expensive than yours that has got a lower carbon footprint

MB Is this the government soft landings

PP1 I don't know what it's called but 2016 is supposed to come in

PP5 Some things are more, we do

PP4 We do, do some bits that are sustainable

PP5 so if you've got, the way just it's where the economics comes into it, so just, just trying to be a competitive business if we can offer a solution that's more innovative than our competitors because it uses less materials so it's cheaper so you know we win it because it's cheaper for the client but at the same it's using less materials and maybe generating less waste so it's more sustainable than another solution

PP1 The other ways though I mean if you're doing I don't know CFA pallets and ordering concrete you will go for the cheapest it doesn't have to be the one that's closest, that's where I think things could be better

MB Why do you go for the cheapest is that because the client doesn't demand it? Is it very much client lead?

PP4 we're in an industry driven by cost

PP5 yeah so everything we do is just driven by cost, people don't really specify anything to do with you know

PP4 It's only some of the very very specific clients where you can start to build it in and costs becomes less of a driving factor but in 99-98% of our contracts cost is key

MB do you try and push forward any of it in your bids or tenders

PP4 We will use it as a selling tool at times when we are pushing forward certain methods of piling to say that we are using reduced materials or we are using recycled materials but it generally falls on deaf ears. At the end of the day they look at the bottom of the quote, if it's cheaper than another contractor then we win

PP1 As simple as that

PP4 And that's the cold harsh reality if the industry really isn't it, cost is key

MB Can you see that changing or do you think it's very much

PP4 I can see it changing as long as the economic upturn stays, I think the reason this got knocked back last time is because we suffered the was it the double dip or the first bit

of the dip and they pushed back the codes for sustainability, it got pushed back and that's what I think the system first was with Warrington but because the cost wasn't there to drive it everything moved to like Kennedy says 2016 and as long as the economic upturn stays in then I can see that's an achievable thing, if we see a downturn in it again it will slip back

PP1 I don't

MB Why?

PP1 They don't care mainly, costs is king

PP4 As I said it's 'got to be' driven by legislation they won't do it unless you can make them do it

PP1 Its very rare even when you propose a solution that people are actually interested what that solution actually entails, it's how much is this going to cost me, it's as simple as that

MB Do you all find that? Do you find that as well?

PP2 Sorry

MB Do you find that as well it's very much a costs driven thing for the client

PP2 I think the politics of the system, great but it can all add to the costs is the big thing for the client's company

PP5 It's only going to be if the government actually legislate and say you've got to do something that it's ever going to happen

PP1 It will be big contracts your HS2 is or whatever that will have that will have that built in, that's more what we deal with

PP4 I'm sure everything in the centre of London will be very sustainable because that's where all the large projects are going in the UK at the minute and that's where the money is and that's where the focus is, I'm sure Cross Rail is probably on it already

PP1 Yeah

PP3 but NAME building a shed hasn't got it

MB So anything that you know about sustainable development, anything that you know about sustainability or sustainable development say you know when you're putting it into your tenders etc. where do you get that knowledge from?

PP5 Well if it's to do with like so we've got we had a consultant in to work out all the carbon that went into all our products was so we've got that information so if we wanted to

present that to a client to say you know this is the amount of carbon we use we've got that information there but we had to bring somebody in to do that. And then there's various different tools aren't there, someone's just brought out a carbon calculator.

PP1 There's a carbon calculator and there's a book done by COMPANY NAME that if you open up bag of cement next to it will be the embodied carbon in it, they have a list of all sorts of products that will tell you the costs and carbon footprint within that product. But I mean until you, they talk of things like BREEAM and LEED and all that, in our industry it's never talked about really is it

NK Would you say your main contribution to sustainability is the carbon reduction and monitoring carbon then rather than necessarily the economic environmental and social aspect, would that be fair to say within your particular industry that you really obviously because you deal with materials is that, would you say that is where your main input towards the sustainability agenda is

PP5 Yeah just because we are a small specialist sub-contractor we are just supplying a particular element of a building so you know we don't get into you know whether its right to build whatever sort of building here and all that kind of thing, all we can do is consider that particular element of it and yeah like you say reduce the carbon and the use of materials

NK Is that linked to the government because of the 2020, low carbon economy zero carbon that's what's driven it

PP5 Yeah

NK ok

PP1 I think the thing, the big thing for me is attitudes. Our industry is very much what's the word I'm looking for? Mature

NK Resistant to change

PP1 Yes

PP5 you mean like dinosaurs

PP1 Yes so if you've got people on the other side of their careers, trying to then talk to them about sustainability and how it might be good for the business

PP5 I mean basically for geo technics were using sort of design codes that are about 60 years old design methods you know

PP1 Yeah but it's always worked



- PP5 Research has gone and you know everyone's ignored it and we carry on doing things the way
- PP1 If you try and pull something new just like well this is the way we've always done it
- PP4 But it isn't is it
- PP5 And its ultra conservative you know in the use of material
- PP1 But but
- PP4 We're not working as sustainable as we could even with all the knowledge that we've got, if you look at cities like Venice, Venice is built on timber piles and we don't have a massive timber piling industry in the UK so it's, it's the comfort factor in what sells. If we turned round to I don't know another contractor and said ok instead of putting pre cast piles in were going to put timber piles in they'd go pardon?
- PP1 Exactly
- PP5 Yeah any sort of innovation whether it's you know to do with sustainability or any new design or anything they're really
- PP4 It's the same with homes, when timber framed homes first came in in the early 80s first of all they got very bad press because people just didn't understand them even though they were massive on the continent but people didn't like timber framed homes because it's not what you're used to when you were brought up as a child you're brought up that you lived in a house made of stone or bricks or blocks you weren't brought up in a house made of rafters and paper and plastic, yet now 20/30 years down the line we're at a point where timber framed homes are becoming more and more popular because of energy bills but energy bills to drive the efficiency up you make your house more insulated and timber framed ones brilliantly do and its brilliant from a building point of view because its quicker but that wouldn't have happened 30 years ago. It's going to take that generation of change and I can't see it, I can see it towards the end of my time in industry but I can't see it any sooner because it's got to be said you have got so many people in the industry that are in the twilight years of their career that will not change. They're stuck in that mentality
- MB So an intergenerational thing
- PP1 But the problem is, for me it's not even going to the client and saying how about this it starts within the house. If you can't go to somebody and say well how about we look

at this as an alternative how can you convince a client when you can't even convince the people who you work for

PP4 One of the most unsustainable things we use is concrete, it's horrendous as a product and it's dramatically terrible to the environment but I can't see in a long time us getting away from the use of concrete or surreptitious products

MB Why, just because it's so

PP1 It's the second most consumed product after water in the world

PP4 Yeah if you look at the energy that goes in to make cement its tremendous

MB What do you think will help drive that change for people to get out of that mind-set and start using sustainable materials?

PP4 It's got to be driven by legislation. If we look at it another way if you go out now and buy a car when you go out and buy a car you look at the fuel economy of it. If petrol was £1 a go you wouldn't give a crap what the fuel economy was you'd drive the biggest car you could because you could afford to put fuel in it

PP1 America

PP4 Yeah like the American's

MB Well that's attitudes

PP4 That's what we need to change

PP1 Attitudes, how to change attitudes is forget it, you've got to twist their arm through legislation

PP4 You've got to twist their arm through their pocket

PP1 So if legislation comes in and forces their hand then things might change, just say well guess what if you think about things differently it might make a difference well would it make a difference to my pocket is the attitude you will get but if they have to do it and they have to look at things differently then you have a fighting chance.

MB What sector of industry do you think could make the biggest difference?

PP5 I think it's probably not, contractors and sub-contractors

PP1 Customers

PP5 They're the one you know all for innovation because they've got new ideas and they're trying to win jobs by saving money which involves being innovative but it's the people like the clients

PP1 Clients

- PP5 Customers who won't accept change and you know they just want to be safe and have something that they know that works because that's where you've got to start
- MB The risk element
- PP5 Yeah
- PP1 The big boys the COMPANY NAME and COMPANY NAME will demand it, they almost likely in the bid projects want to see the carbon cost of or the risk, so you have to comply but if you are dealing with people that don't really care, just how much it's going to cost them
- PP4 It comes back to attitude again, I can't remember what it was I think it was one of the large newspapers when this first came out printed loads of stuff about it and then put by the way we're carbon neutral because we plant a tree and in their eyes that made them carbon neutral because they planted six trees or something for every hundred thousand papers they send. But that's not what were after were after a complete change in the way we think and were after the change in what we're using and it's not going to happen overnight, it is a change in attitude and that as I said before that's going to come from legislation change and it's going to come from generation change. As I said its probably your generation coming up into the industry that are learning about it as its coming into it but you will come up against resistance, probably from NAME and myself
- PP5 Its all box ticking as well isn't it so like any projects we've been involved in they've I don't know for BREEAM or whatever ratings they've had to have a certain amount of like 10% of energy that's sustainable and then they just like they'll just say I don't know we'll either get something geothermal or stick a little wind turbine on the roof and they can then tick a box
- PP4 It's the system first. We developed us as a company developed a foundation system called system first which was to do with the current sustainability wasn't it and they were trying to sell it and all the developers kept turning round and saying well in order for it to be a sustainable development all they need to do is put a bike shed on it. If I put a bike shed on it I tick the box, I don't need your foundation I can just use trench fill. So again, changes have to be made in the way people perceive it and it's got to be driven. People aren't going to do it voluntarily. As Kennedy said they're only going to do it with their arms tied to their backs and it's going to hurt them in the pocket

MB Do you all agree?

PP3 Definitely. There's no way you can try and convince a client to try and spend more money for a better quality product unless that's what he's actually after, after is some quality. They'll have cheap and nasty and very unsustainable as long as the cost is right

MB Even if in the long term it's better for them

PP4 They generally don't care because they've sold it

PP1 If you're a house builder you're not going to live in the house

PP4 They flog it as soon as they're built, they really don't care

PP1 Like the show home before it's even built the house is sold so you just want something that looks like that one and move on

MB So you think it's going to be very much government lead

PP1 It has to be

PP3 I think it will be like the health and safety at work act it will take years and years but eventually it will click. 25 years' time you'll probably be, sustainability is the top corner

PP1 Not now

PP4 You're going to leave here in tears

PP3 I know sorry!

PP5 Its everyone's attitude to everything though isn't it do you know what I mean, everyone you want what you can get now that's cheap you know what I mean like Primark or whatever just, and that's the attitude of this generation even isn't it

PP4 Even if we use that analogy they wanted to expose when they did the programme on the Primark show 6 year old children putting sequins on stuff people still go into Primark and buy it because you can buy a top with loads of sequins on for four quid. The same way that Jamie Oliver did the battery hens and showed all the hens in terrible things, people buy it because it's cheaper. They stop buying it for the first week and then they remember wait up I've got less money I'll go and buy the cheap stuff again

MB Because it's something that's not tangible it's sort of they, when you something on the news it's not sort of direct because it's in another country it doesn't affect you that much so sustainability it's not going to affect us in our life time do you think that's why people aren't that bothered about it

- PP1 House building, which is mainly what we do, me as a prospective buyer I would be lucky to get a mortgage so am I bothered about how sustainable the house is? What incentive do I get to go for the more sustainable?
- PP4 You'd have incentive though if you got reduced council tax because your house was sustainable
- PP1 That's what I'm saying what incentive do I have to actually go for a more sustainable home?
- MB So you think incentives might drive it
- PP4 Well coming back to what we said there's got to be a saving to the end user and the developers got to be able to see it, if the end user is buying a house because it's cheaper and that house can be sold at a premium because of it then they'll do it. If the end user won't pay that premium to do it then it's not going to happen.
- PP3 I know somebody whose just bought a sustainable house erm, it's not quite like span dangle and Grade A passive House or anything like that but he's got this almighty boiler that just does about everything and he paid a premium for that and I think his gas and electric bills are like £12 every 3 months it's ridiculous
- PP4 But what's the repayment
- PP3 But he did pay he did pay
- PP1 How much was his house worth
- PP3 I think it's about £130K
- PP1 Because Gary Neville just built a telly tubbies house in Bolton somewhere and that's apparently massively sustainable but how many of us can actually afford
- MB Well affordability
- PP1 Affordability so that's what I'm saying so for me looking to get on the housing ladder I will go for the cheapest
- PP4 You've got to look at the life cycle of it as well, as Nicole said we looked at, you can put in a massive sustainable boiler that reducing your energy bills but it might take 15 years to pay for itself. A lot of people don't want to be in their home for 15 years so they aint gona do it and they aint gona pay a premium for it
- MB Is life cycle assessment considered in any of the projects that you work on in terms of choosing materials?
- PP1 Life cycle what?

PP3 It stays in the ground and hopefully that's where it will stay forever

PP5 Not particularly

PP3 How long? 100 years?

PP4 We work on a 60 year design unless its highways then its 100

PP1 Whatever is acceptable to the developer then what it is, basically oversee what we do if it is then we do it

PP3 Because a house is like 35 isn't it

PP4 60

PP3 60, is it?

PP1 Some projects we do offer 25 years on

PP4 That's highways and network rail

PP5 And the other thing I mean you know the topic of sustainability we're owned by a, our ultimate parent company is a big Plc you know on the French stock market and Plc are into, well they certainly like having the word sustainability don't they because erm you know social responsibility and everything like that you know its driven by shareholders and investors and that kind of thing and it's not really filtered down to us yet because were far too far down the chain but err you know it's part of all the mission statement and everything that well be sustainable and look after employees and that.

PP1 RB talked about that even before the topic of sustainability was somewhere

PP4 RB was very much, RB was a person that very much thrived on being at the leading forefront of the market, the problem he had was we hit an economic downturn as I said before, people couldn't afford it and the market moved on. We were trying to sell people a Ferrari when they were only willing to pay for a Fiesta and that was what we were doing and that was the problem we had.

PP1 It still is the way

PP4 And until it gets to the point where you turn around to people and say you can't drive a Fiesta anymore you have to have a Ferrari they aint gona buy it.

PP3 Tax

PP1 But it's happening now in the motor industry because if you buy a car with certain emissions you can drive in London and other people are paying in London whatever it is you don't pay because of the emissions from your car

PP4 But it still comes to the point that if you earn enough in London you'll still drive a Chelsea tractor and not give two craps

PP3 Yeah but if you've got the money

PP1 Yeah but that's essentially what we're talking about the majority

PP5 All the quotes will be from Tom

PP3 I know Chelsea tractor!

PP5 Chelsea tractor!

PP1 I know it's depressing sorry but

MB I know

PP3 You might as well just pack up

PP4 You're not doing this as like as post grad thing are you

PP3 Yeah PhD

PP4 Oh on sustainability?

MB Yeah

PP4 That's not very sustainable

PP1 Look at all the paper you're using

MB I know

PP4 Recycled paper is not sustainable, it takes too much energy

MB Apart from costs is there any other barriers that you think stop it being driven forward

PP1 Costs and attitudes

PP4 Costs, as we keep saying cost is king

MB What about responsibility?

PP1 Who's responsible for what?

MB Do people take responsibility? Say designers designing out waste or do they say it's not down to us it's down to

PP1 Like James said we've got shareholders to please that's, as long as were making the profit happy days

PP3 Again I think that responsibility definition all that will become clear when legislation is enacted because it's the same with the TDM regulations that all the positions and responsibilities are all defined and that's how it is because that's what you've been told to do and once that sustainability act comes out in 2016 it will be the same, the project manager will have this responsibility for this sustainability and the client will

be expected to carry out X,Y and Z to fulfil another box ticking exercise as it may be but in years gone by it will start to be more accepted and more well in another generation the norm

PP5 Its interesting sort of thinking about the construction industry isn't it and erm just the way it operates

PP3 It's reactive

PP1 Its so behind

PP5 but it's so, you know health and the fact that it's all separate companies you know contractors and the consultant engineers and everything, nobody works together and ' been reports about the construction industry for 30 years, you know Latham and Egan and whatever it was before all that

MB Wolstenholme recently as well

PP5 Yeah you know and saying we've got to work together and everything and now whoever this guy is the Chief Construction Officer has said all this, what's this 2025?

PP3 Yeah

PP5 The vision and everything else like that, you know CDM has tried to get people to work together but they just they just still don't they still go back to the I'm protecting my little company and it'll be the same for sustainability you know how do you get people to work together on anything

MB Is it about competition they don't want to work together because its

PP1 No but there's a benchmark already, the car industry does it all the sustainability working together they do it they do it so well

PP4 They only do it over here

PP1 What do you mean over here?

PP4 If you go over

PP1 If you go over yeah there's a benchmark anywhere

PP4 If you go over the sea into the states and Canada they don't give a crap they still produce cars that do 6 miles to the gallon

PP1 Still got a benchmark over here to follow

MB How do you think we could better get industry to collaborate with each other then?

PP3 I think that will come with BIM as well because that's the key word isn't it collaborative working isn't getting that together and if you can't get onto a tender list



PP1 But we haven't even started

PP3 Well we will though because in 2016

PP1 2016, we haven't even started looking at it

PP3 I'm sure, I'm sure the bigger guys are aren't they at head office

PP1 No,

PP5 Someone's looking at BIM

PP3 Surely they are

PP4 Nigel's looking at BIM but it will come down to

PP3 Yeah and it will it will happen

PP1 I was in a meeting that BIM was talked about

PP5 Oh right

PP1 the question was, was that go to this meeting and come back and tell us what it is was the kind of response

PP4 It will come down to what we said earlier, we do contracts, we did contracts for COMPANY NAME where everything has to be 2 years old or less and highly environmentally friendly unless you've got something that isn't and it will do the job and its cheaper. We've got it coming into London where it was Euro? Cap euro engines in London for running in London, JCB is going to monopolize the market on it unless there's a rig there that can do it cheaper and they can get away with.

PP3 Mmm

MB So it's very reactive rather than proactive

PP5 Mmm

PP3 Very

PP4 The industry has got to toughen up on it, the industry has got to demand it and that demand will only come as we said before through legislation. It's going to take legislation to change the perception of the industry. Once we change the perception of the industry and we've re-educated clients because we're not going to change the perception of clients they are just going to want to spend as little as possible as make as much as possible, once we've changed all that then it will start to come but it will be a very very slow process

PP5 Its like network rail though isn't it and how if you want to design anything for network rail and all the hoops you have to jump through and how it's got to be way over the

top on design they don't like any innovation at all do they. You know even if you've got somebody and it's the same for like building regs or anything, even if you've got somebody whose keen because you can offer them something that's sustainable or they want to do it and they want to be innovative like they can't because then there'll be something like that that blocks it and they say oh no you can't do that

PP1 It's like health and safety

PP3 It really is, I think it is

PP1 We have been, some companies have been kicked off the tender lists because of the accident prevalence rates, so that supports change and you can't walk across such and whatever so people because it's hitting them in the pocket are reacting and making the necessary changes

MB Because of fines and

PP1 No no you won't even be on the tender list unless you get the jobs, they will look at your accident records between last 18 months or whatever it is

PP4 But are they making positive changes or are they just ticking the boxes because what you tend to find on that is a lot of contractors have stopped reporting accidents.

PP3 Mmm hmm

PP1 But then you offer your employees incentives to report accidents

PP3 Yeah ha ha ha

PP1 Two good things come together

PP4 But on one hand your offering incentives to report accidents and on the other if you don't report it here have a bonus

MB Just moving away from health and safety sorry

PP4 But it's what will happen with everything

MB Yeah but in terms of incentives what incentives do thin might help drive sustainability then? Other than legislation if there was some incentive there

PP4 If it was a home if you don't pay very high council tax

PP3 Yeah, the same thing with the emissions if you could demonstrate to the potential buyer that buying this sustainable house is going to save you X amount of pounds over its lifetime then you would be faced with the choice do I want to buy this house here that's cheaper but that's going to cost me more in the long run. I think education,

education and giving people the knowledge to be able to make the decision is probably what we need to do.

PP4 Well we come back to the problem is the life span of the house is going to be quite long yet person utilising the house might not be that long. It's easy in the automotive industry because lifespan of the car is relatively short 5-6 years and its scrap so it's easy to see a return in 5-6 years not in a house where you've got a design life of up to 60 years. How many people do you know that buy a house and live in it for 60 years?

PP3 But can't you just sell on that benefit once it's in the house it's there?

PP4 But you've paid a premium for it and never had the benefit

PP3 Well no you are because you're constantly clawing it back aren't you every week every time you using your energy

PP1 Why not build in BREEAM into building regs

PP4 You're not claiming back unless

PP3 But you would have spent that money if you went and bought the house that's just got the cavity brick wall you would have spent that anyway so you're offsetting it from what you could have bought with what you have bought

PP4 well you're not offsetting it

PP1 I suppose you'd get a bigger mortgage

PP4 It depends what the return is on it,

PP3 They don't pay enough to get a big mortgage

PP4 The return on the mortgage

PP3 You would sell it for a bigger value than the one that's normal

PP1 But I'm struggling trying to get a mortgage now

PP3 Oh right yeah ha, you'll have to get a bigger deposit Kennedy

MB when you say we need to educate people who do you mean, who do we need to educate

PP3 Well everybody, yeah I think it's a blanket unfortunately, obviously the people that spend the money are the ones that need to be educated the most but it's also the people that are buying the product as well because if they want a sustainable product then people will make it and again so it's the client and the consumer

MB Do you not think it's down to industry to maybe educate clients?

PP1 No

PP3 Yes, I would say so

PP1 I say bottom up because if

PP3 It depends where the driving force is coming from

PP1 If you're talking about pockets

PP5 But it's like supermarkets isn't it do you know what I mean like all the Jamie Oliver and the horse meat and anything else like that that you can think of, anybody would say oh yeah well supermarkets are this but would you choose to shop at like your local shop where its local produce you know that's all sustainable isn't it because your supporting local businesses and it's not got a massive carbon footprint to transport it. At the end of the day we can't be bothered well just go to the supermarket and get what's cheap and ignore wherever it came from and have no moral conscious or moral responsibility for it

PP3 Easy

PP1 Because I can barely afford to put food on the table so I will get what I can afford

PP3 Mmmm

PP1 I will go to the local market or supermarket or local shop it will cost me a bit more for a better product do I can I actually afford it

PP4 Yeah no I would agree with that

PP3 False economy

PP1 It isn't it isn't if you can't afford it, if all you can afford is to shop at Aldi you're not going to shop at your local high street butchers and green grocers which is why we don't tend to have any

PP3 Using food is a bad example if you want something you save for it that's what I do

PP4 I'm not going to save for my weekly shop, no that's why I said using food is a bad example if you can't afford something you save for it, you don't get it until you can afford it.

PP1 What I'm saying is with our industry our company is mainly focused on house building and there was this big thing in London about social exclusion and whatever a lot of people on medium to low incomes have been excluded out of London because they can afford so here you are just barely affording to get a mortgage and live in London are you actually going to look at all the stuff that you can't afford? You just,

PP3 No but you can't say that sustainability is not going to develop just because people can't afford it

PP1 No no no that's not what I'm saying

PP3 It's a bad excuse

PP1 No no no look what I'm saying is

PP4 But ultimately

PP1 What I'm saying is if the house

PP3 well that is that's the one reason it's not why it can't develop

PP4 Yeah but that's why it's been pushed back

PP1 no what I'm saying is if there is an incentive for me to actually get that house from the local council say I actually you could spend a bit more but your council tax over 10 years or whatever will be reduced because it's a more sustainable home

PP3 hmm hmm

PP1 You might trump up a little bit more to get that house because monthly your outgoings

PP4 You'll only trump up more to get it if you save it, if you save more than you spend for the premium in the lifetime you're going to be in that house what I'm saying is with a house if someone stays in the house for 10 years then you can see that return on that extra premium that you've paid it's a bit in the back burner in the 10 years it can't be over the lifetime of the house regardless of resale value

PP1 But I can sell that to you H

PP3 Exactly

PP4 You can't go off resale value of a house when you've got no idea what's going to happen to the market, it might end up in negative equity

MB I think that's the same in sort of building not the housing market but just schools etc. and gyms and other facilities, it's the end user

PP1 No that's slightly different because if money is coming from

PP4 The government

PP1 Pier 5 or government or network rail most of the time it's as long as you tick the boxes

PP3 There's got to be some effort put into it though because to get the tick in the box you have to at least satisfy a minimum standard if that standards raised then surely well all raise our standards and our sustainability efforts will be much more

- PP1 Network rail and the jobs that I've done with network rail most of the time the hassles that you get are just the box ticking exercises its never anything actually within the design itself its whether you've signed in the right place kind of thing
- MB Do most companies just box tick then they just do the minimum requirement and once they've met them they
- PP3 I would have thought so yeah
- MB Ok
- PP1 Unfortunately
- PP4 Well if you look at solar energy solar energy was massive and there was loads of people installing solar when it was capped on the sell back rate, that went and now all the solar companies have now gone bust
- PP3 Yep, there's still a few going round but not very many because you're not making money on it anymore are you so the tariff fees are crap
- PP4 You're never going to get the money back that you've invested in them because you've lost that minimal cap on your sell back fee to the grid
- MB yeah and people want immediate returns as well not long term
- PP4 When you looked at it I did a lot of work for Vodafone before I came here which was about 10-11 years ago an Vodafone at the time were looking at wind power to power these cell sites because they're in the middle of nowhere and they're costing a fortune to put electric into them. They looked at wind power did the research on it and came to the conclusion that it was pointless because they kept breaking regardless of how much they spent on it, in order to get a wind turbine that will work the costs would be astronomical therefore it was easier to put a 2 mile power cable in and these are in sites where we have to concrete using helicopters
- MB not very sustainable
- PP3 No
- MB Ok I'm just conscious of time so if we just move on to the last topic erm how do you think education can help in industry, this is where my research
- PP4 Education as we said before, education is going to happen from your generation coming through but it's going to take help from legislation and it's not going to be immediate you might see it mid to late your career you certainly won't see it at the

start of it and you will come up against so much opposition that makes us look kind of quite nice

PP5 I think the key is that you, that sustainable is solutions

PP3 Is statutory

PP5 Have to be the cheaper solutions you know what I mean, that's the sort of innovation that you need isn't it how

PP4 But we don't have to be the cheapest

PP5 No but that

PP4 They don't have to be the cheapest they've got to be the acceptable solution

PP5 Yeah but then like through you know education and just keeping it on the agenda and getting people to think about it

PP1 How do you build in responsibility is a good question

MB So for me I'm trying to develop these education interventions which I'm going to pilot with students and then I'm going to take out into industry, hopefully you know what do you think I could incorporate, say would you prefer it to be in CPD, do you think industry would be willing to do that if they get the CPD points for it attending a course, or something that they can do online.

PP4 It doesn't overly work. CPD doesn't overly work because you'll go along and CPD tends to be at a lunch time erm I've been at a consultants where I've been receiving CPD for people and I've been here where we've given CPD and at the consultants it was great because you got a free lunch and it was an extended lunch break where you weren't doing any work but you didn't really pay any attention

MB So people just get the lunch and then leave essentially

PP1 Hmm yeah

PP4 If people want to learn about it they'll learn about it if they don't enforcement

PP1 The danger you have

MB But if it was made compulsory I attended something up at BRE and they're developing a tool there for CPD where you don't go along and get a free lunch, it's an online tool where there's something that makes it compulsory for you to have to complete this in order to get your CPD points

PP4 Yeah we've got loads of them but we never do them

PP5 If you're in a professional body like where you know yeah you have to do your CPD and you have to be you it's part of their thing

MB You think it would have to be integrated into professional bodies

PP5 Yeah you know the IC talk about sustainability and stuff like that so if they're driving their members but then the people again there's so many people who aren't members of those those institutions

MB You don't have to be a member do you

PP1 No you could end up also being part of a box ticking exercise. I went I had lunch what did you learn?

MB There's no lunch were taking lunch out

PP1 No no what I'm saying is

PP4 We won't go then

PP3 Yeah that's it no one's logging in

PP1 What happens sometimes in industry is that they'll take me and say well you go and you come back and tell us

MB And ah ok and feedback to everybody

PP5 Yeah

PP1 and sometimes even before you even go it's already out of mind

PP3 Very much depends

PP5 I mean there's so many people in construction as well that it's just any old Jo blogs isn't it you don't need to there's no you know you don't have to like if you were a doctor you have to be properly qualified don't you, if you go to your GP and just whereas in industry people have no qualifications no professional affiliation or anything and they're running companies

PP1 Yep and then taking people like me and say well you go and you come back and tell me so it's a question of, they're looking for buzz words to make interesting to them and worthwhile to them and if it's not and if ok well look into it

MB How do you think, I know we're going to sort of get graduates coming into industry but as you said that's going to take a while how do you think I could come into industry now and do something within education maybe industry and HE collaborating more with each other is there something that



PP3 You could perhaps erm I know it's a bit piecemeal but you could go to higher education and perhaps offer a module on it get it into the curriculum

PP1 They already do that

PP3 Oh is it oh right ok

PP1 Anything sustainability

PP5 And like all the professional CPD through professional institutions where they have to do CPD all the local associations

PP4 yesterday was sustainability

PP3 I didn't got to sustainability, I didn't do any

PP1 Somebody goes for, what does John Garland do

PP4 Good question

PP1 Those breakfast things

PP5 Yeah there's breakfast clubs

PP4 They're not sustainable

PP3 They're not CPD!

PP1 No what I'm saying is that you could talk about that

PP4 He kind of does but he uses it as a sales

PP1 Not NAME, NAME does it

PP3 JR Knowles they're good they do lots of seminars and they're generally free aren't they

PP1 If you go to those breakfast clubs I'm sure somebody

PP5 Yeah all like the ICE and everything they have their local association evening meetings don't they you know where somebodies talking on a topic and they're you know people go to those and that's like free CPD and stuff

PP1 but again it goes back to what you said you and I will go because with IC you need to say you have been to this

PP4 People go to NAME breakfast clubs to get breakfast and they go from breakfast club to breakfast club to breakfast club because NAME stopped doing it, but she's the, certainly she was CPD not for the food

PP1 no the CPD I will go because I have to fulfil my professional requirements whereas there are people in industry who don't have affiliations and things like that so they won't go an they're the ones running the, making all the decisions

- PP3 Vinci our parent company, they actually have a bonus scheme where you have to fulfil X amount of hours of CPD in the year and then you get your bonus and you've got to do it you've got to attend in works time
- PP5 I was going to say the other thing that drives a lot of things is insurance isn't it. If you haven't got any insurance you can't operate as a business can you so if your insurance company says you've got to do something like that's the only other people who can make you do something, so if your insurers are responsible they're going to get insured premiums are going to be higher if you're not a sustainable company
- PP3 Mmmm (interesting)
- MB Yeah so with what you were saying the bonus scheme you'll go along to that to get your CPD points and you get your bonus but are you really sort of bothered about anything that you're learning about sustainability.
- PP3 I think that depends on the person though and we can't all be tarred with the same brush, I'd enjoy it but I'm just a swot so
- PP4 It's the same thing if you go on a course, if we say Kennedy on a course for sustainability Kennedy might be on a week's long course on sustainability learn about it and he'll be like come back going yes sustainability is brilliant and they'll go yes sustainability is good, day 3 he forgetting about it day 4 he's forgotten about it because it's not used.
- MB because you go back to the everyday
- PP3 They wouldn't send him on it though if they weren't bothered though would they, if we weren't bothered we would all be sent on it and we would be continuing it throughout
- PP4 But we get sent to it so we can
- PP1 It's like BIM, for me to be BIM level 1 or whatever
- PP3 Their attitudes stink! I'm sorry
- PP1 No to be BIM level 1 it's not just something that you'll just wake up tomorrow and say well we'll do it
- PP3 No it's not definitely not
- PP1 I will take years and years of preparation to actually get to that stage
- PP3 Definitely
- PP1 we're now in mid-2013 and we haven't even started

- PP5 It's like the Euro codes
- PP1 Exactly
- PP5 The Euro codes should have I mean the British standards were withdrawn when 2010? And still most things are designed to British standards even though we should have been using the Euro codes for the last 3 years
- MB Why do you think that is?
- PP3 Are we going to get fined for doing it eventually?
- PP5 Again all these old dinosaurs
- PP1 ha ha ha ha ha
- MB So it's the guys at the top?
- PP1 No the industry, designers are still using it, I mean I used to work with designers who still designed to steel code 4490 when 5950 came out, 4490 superseded in about 1978 but it still works people were still accepting it and 90% of clients well 95% of clients will still accept designs to British standards, its only when they stop accepting designs to British standards companies like COMPANY NAME and the other ones out there will start doing the Euro code designs, we aint gona give em it if they don't want it
- PP3 In terms of the Euro codes isn't there some sort of like limitation of how long it takes for this country to implement it across the board, wont we get fined by the European Union if we don't?
- PP1 No no, its client driven, if your client is building and they just wanted to use British standards
- PP4 You've got to remember were in an industry that's took a kicking over the last 6-8 years we as a company are now trying to do the same amount of work with a third of the staff, no one's got the time which as NAME was saying if something comes on sustainability, we'll pick the last person in the office whose still fresh faced and not having a massive input on the business but send him off to the course get him to make the notes, come back and he might do a 10 minute presentation in a monthly meeting and that will be it. People haven't got the time at the minute or the resources to send people off to do it, as we said before it's got to be driven and they've got to be forced to do it to change it and until that happens it's not going to happen.
- PP5 We're not all old and cynical, were old and cynical aren't we?

PP4 We're not old and cynical we're realistic because we work at the mucky end of the stick and we see the problems and we see how people are and how attitudes are

PP1 and the other side of the coin is when network rail do some and say well British we don't even want to see it everything has to be Euro it's like eeeuughh

PP4 But then you'll design something for network rail and it will be 8 metres and they'll say no we want it 10

PP1 Yeah

PP4 For no reason other than I like the number

PP5 ha ha ha

PP4 But we've had that and yet it's gone through our senior geotechnical engineer, they wouldn't accept because he's not got enough qualifications so we've had to get like NAME to sign it because he's got the box ticking qualification yet nearly not as competent as our senior geo-tech, it's just

PP4 Yeah completely and utterly

MB This is what I keep finding but there must be some something I can put into these educational interventions and I don't know take them to industry and just

PP5 It's a big thing but you've not got to be put off by, any small difference

PP1 what's the council's response to sustainability and building regs

MB Sorry

PP1 what councils take on sustainability and building regs?

PP4 Consultants?

PP1 local council

PP4 Oh local council

PP5 Local authorities

PP1 Local authorities

MB Oh ok

PP1 What's their attitude toward it?

MB Erm well Agenda 21 was brought in wasn't it but again I think that's sort of slipped as well because I was speaking to one of our lecturers and on her students did his masters thesis on it and then Agenda 21 came in and there was a big drive on that but again the local councils are starting to sort of go back to their old ways and change their mind-set again

PP1 It might be interesting if you went there and tried to gather their thoughts

MB Do you think it could be driven at a local level?

PP1 If they build it into their local, into their building regs or whatever then half the building that adhere to will start

PP4 The building work is driven by industry, building work is set up for them to do best practice

PP4 The NHBC say

PP1 NHBC or whoever I don't know somebody along the way

PP4 NHBC again you're back to insurance companies

PP5 I mean you might as well teach graduates because like they'll be running companies one day one day won't they but it will just take about

PP1 No but that's the thing because I'm a graduate from last year and then I did BREEAM I did LEED I did all the fantastic stuff and you come into industry and nobody even talks about it

PP5 so in 29 years' time you'll have forgotten it, when you're in charge Kennedy

PP4 We were taught about it back in 2005 at uni and we have never used it and we had BREEAM then, doing BREEAM assessments

PP1 BREEAM and even all the Green star and all the

PP4 Broughton Baker was like a massive sustainable place at the time, yep

MB and they didn't use it

PP4 I have not seen it since I came into industry

MB Is that because the client isn't asking for it is that the bottom line?

PP1 Look at the Olympics last year, low carbon sustainability and all that, yes it was a big thing but how many people actually took part?

PP4 Was the Olympics sustainable?

PP1 They tried to be, they lied about it but you know they tried, they made all the right noises

PP4 They ticked the box, yeah

PP1 oh we've cleaned so much soil

MB Do you think these seminars or webinars, I work for a company called COMPANY NAME and they do a lot of seminars and webinars where people log in, do you think that might be the way forward?

- PP3 I think anything is better than nothing, you've got to just get it out there haven't you and if that's exposing the issues,
- PP4 But you've got to make people do it
- MB What do you think about universities maybe starting to do that then offering whatever they're offering on their curriculum sort of snippets for companies such as yourself via webinars
- PP3 If it's free
- PP4 If it isn't anything forcing them to do it they won't do it
- PP3 If it's free they'll probably attend, time away from their desk
- PP1 How about trying to target people at the top even within our company to get them to listen so that when Tom then goes and says oh sustainability you'll have broken ground so to speak
- PP5 Big companies with like, if they've got, if they're Plcs who've got shareholders they'll have to be sustainable won't they and then if they've got a training partner who organises you know we are, our lady in HR like she looks for training providers and stuff like that so anything that's like you know webinars and things like that you know if you can get people like that and then they promote it within their company well you know hopefully some people will take it up because there'll be some people who'll be keen for CPD and interested and there'll be some who won't but then ??
- MB What about just to create that market demand for sustainability? For companies to start creating it themselves so that when you're doing tenders you say this is our company ethos this is what we do, do you think clients would buy into that?
- PP4 We do use it as a sales tool, NAME will go out and say come and use our steel tube it's from recycled Aberdeen casing, its already been used so its second hand so its sustainable and they go ooh that's good what price is it?
- MB About costs again
- PP4 Or look at our CHD pole that uses 60% less concrete than a CFA pole, we can get it to pull up shorter, brilliant, is it cheaper. If it isn't then then they'll put in a CFA pole instead
- MB Ok. Has anyone got anything else that they would like add before?
- PP4 We'll give you a Samaritans number
- PP5 Have you read the tragedy of the commons?

MB No

PP5 Oh you should read that paper it's really depressing

MB Ha

PP5 It's from the 60s or the 80s or something like that it's an old paper but it's about sustainability. It will make you really miserable

PP3 Oh no don't read it

PP1 What message are you trying to drive? Like I said I'm a fresh graduate so I know a bit about it.

MB What do you think, so you know you said you came out of education in 2005 last year and you haven't see it (sustainability) what do you think will help graduates help drive it forward

PP4 Graduates will never drive it forward

PP5 Do you present your ideas and they're just dismissed?

PP4 Graduates will never drive it forward it's got to be driven from the head of the firm. There's an old saying if the head of the fish is rotten the whole fish is rotten and it's the same to this. If the head of the fish doesn't care about sustainability the tail isn't going care

PP1 That's what I'm saying maybe you need to go a bit higher, or much higher

PP3 I'll sign your petition if you want

MB So management?

PP1 Yes

MB I have found that in the literature actually if management is on board

PP1 get them interested even a 15 minute meeting

PP4 But again there's got to be the driving force there for the client to accept the sustainable product because they will start with pay a premium for it but when it becomes common place the premium will disappear because the costs will come down due to less use.

PP1 It's not strictly true that always sustainability makes things more expensive and that's the thing that people don't always understand

PP4 But it's the perceived perception in industry

- PP1 Sometimes when you do talk to people that matter and make them realise that actually it's not always, it doesn't always make it more expensive, then maybe you might
- PP4 You see the bit thing for you industry, I feel they ought to make it more helpful right at the very start which is reusing foundations, if they keep accurate records of where they are what they can take load wise then its brilliant its sustainable, it means were not putting foundations in on the downside it means RB has gone bust because we don't need to put foundations in anymore.
- MB So you do think exemplar projects of say a project that sustainable and has cost less money people need that evidence before they invest,
- PP5 MMM yeah
- MB So if I put something in my interventions like that, I know it's to change the perceptions and say well actually it doesn't cost that much you need to people to see that
- PP5 MMM you need to find something that costs less you know it will make people think
- PP1 and it's that mentality that it's not only about, I don't know how you can, but what we do the whole life aspect of what's going on
- PP4 It will be easier if you look towards a larger building it's difficult looking at the domestic market because as I said before they've got a very very quick turnover and a very short lifecycle for the occupant but if you look at a larger building for example if you look at Cross Rail and if you look at The Shard down in London if you look at all buildings going up In Manchester they've got a longer lifespan they're gona tend to have one owner of that lifespan because its seen as an investment so they will see a return on it. That's going to be the easiest market to get it to because they'll see the rewards of becoming sustainable and they'll see the rewards of paying a premium at the start of it. The domestic market is going to be the last one to come in because it's going to take, because they're not there long enough to see it and you've got to be there
- MB I'm not focusing on the domestic market I'm talking about the bigger buildings and those clients so that will be easier to
- PP4 That will certainly be easier and I suspect you'll be seeing it a lot down, especially what's going on in London at the minute, our industry tends to be driven out of London then it will come up north very very slowly



PP1 It's also the organisations involved in the large building, like I said COMPANY NAME and COMPANY NAME, COMPANY NAME they build in carb calculators

PP4 Have you looked outside the UK?

MB No I'm focusing on the UK only

PP4 It might be interesting to look to see what they're doing on the continent because our industry is very very behind, were probably 20-30 years behind what's happening in Europe and in Europe there is an awful lot more sustainable building going on in what we do, there's an awful lot more timber poles being driven from sustainable forests and there's an awful lot more reused materials going on. And that's where we'll start to get to in 20 years' time, were just so far behind

MB Do you mean to look at that and maybe come to the UK industry and say look this is what they're doing there its costs X amount why aren't you using these practices

PP4 Compare it to what they're doing there, yeah

PP1 What happens is when I went to Euro code training there's almost like this animosity that oh the French are telling us what to do again, sorry?

PP4 Its wasn't the French it was the English

PP1 Or the Germans they're telling us what to do again with this Euro code, the Brits way had worked 60 years why do we have to change what we do? But just because it worked wasn't the best way to do it. It's as simple as that, just because something works does not then necessarily mean it's the best way to do it

MB So there's cultural attitudes as well

PP1 Oh yeah, animosity

MB Ok, I think we'll wrap it up there guys' thank you very much

PP1 The head of the fish is where you need to

PP5 Does it help what you're trying to achieve though?

MB Yeah well I mean I've done a literature review and this sort of reiterates what I've found so it confirms what I've found in the literature

PP3 That's good

MB It's not really helping with my interventions much but it's just maybe that I have to change my research and do something else or focus on different side of it

PP1 Not necessarily, don't go for the easy stuff, the easy stuff doesn't get you anywhere, the hard stuff

PP4 Just remember cost is king

MB I know well

PP5 Well if it all kicks off and the government change legislation you'll be the expert then won't you so happy days

MB well me and NAME both did psychology for our undergrad, we asked to do this so the construction industry is a whole new ball game to both of us isn't it?

PP3 You got asked to do it?

N Yeah we both did psychology degrees and they said oh well you'll know about changing attitudes and then we just got drafted in to do PhD's

PP4 does that mean through all of this you've been sat there analysing us?

PP5 Yeah I thought it was a bit like, the way you were sat at the other end of the table I was like she'll be analysing us all

MB Yeah know it's just because they wanted us to take what we know from psychology to see if we can try to change attitudes so I've been looking at well we've both been looking at emotional intelligence because it's huge in leadership and academia

PP5 definitely

PP1 what's that

MB emotional intelligence

PP1 what's that about, I don't even know what that is, I'm worried now

PP5 I think were too stubborn for that

MB Its how

PP3 We have no emotions

MB It links with attitudes, we've both found sort of correlations with attitudes, the higher your score on emotional intelligence you have more positive environmental attitudes, its maybe sort of

NK Its to do with liking with the environment because mine, I tried to extend, normally you think you about emotional intelligence amongst people so are you, if you're having a bad day Tom are others compassionate to you having a bad day or are they just saying oh well tough luck

NK Whereas with my PhD I tried to convey that perhaps that could transcend into non well obviously nature's a living thing but it can't interact with us in the same way as people and I did find that certain personality qualities that we have will actually make

you more likely to care for the environment so you wouldn't necessarily litter you would recycle or actually bin it rather than, so there are things with it but it's trying to get that across to people in a way that makes sense and not in this kind of I should have been wearing a tin foil hat during this so you can't read my thoughts, people get scared of that

PP1 That's how I feel

NK No well that was not done so, if that makes you better

MB Emotional intelligence is just how aware you are of your emotions and the emotions of others and how your able to sort facilitate those in certain situations but it's usually done at a subconscious level you don't realise you're doing it but

PP4 mm it depends if you're aware or not

PP3 there is nobody in our office who has got any emotional intelligence

PP4 If you're a manager that's 90% of your job, in order to manage staff you've got to be able to sense the emotion of the staff and then if you can't you're screwed

MB Well that's emotional intelligence

PP1 Do you care?

MB It's huge in the leadership literature

PP5 There's only one person who's ever mentioned that and she put on her CV that she had excellent emotional intelligence

PP4 Did she yeah

PP5 Yeah and she was the most difficult person I have ever had to manage, in fact id say she was unmanageable, she was difficult

PP3 I even put that and I'd never even hear of it today

MB Employers now do emotional intelligence testing when they're recruiting now it's become huge

PP1 I don't even know what it is

PP3 It's not Lauren was it

MB It's just your awareness of your own emotions and those of those around you

PP4 You do it as a manager, you manage it to create to get the best out of your staff if you don't you end up with very resentful staff if you're a manager

PP5 But I bet it's like you were saying about the environment it makes sense doesn't it because it's like people who love animals, they go to almost indefinite lengths to like

save some little stray bird or something they've found in the garden do you know what I mean and the other people will just like

PP1 Yeah but some of those people are miserable though

PP3 Yes yes

PP5 you know what I mean there's a whole range of people isn't there you know

MB Yeah and especially personality sort of variables, people who are more conscientious

NK People who are more agreeable and conscientious are the those people that are really responsibility driven, they take responsibility for everything, hard workers and are also then those that are open to new ideas so then they say oh ill just take care of this cat today or you know stray animals or whatever, they they're the ones that are most likely to be persuaded I think to care for the environment

PP5 But it's interesting too because construction is like such a macho industry and you know that's been all the problem with like health and safety and everything else like that, people you know do, you know lads on site doing crazy things because that's what they think they have to do and they you know do it

PP4 that is slowly changing though

PP5 That is, I know that's changed now but that's been a changeover bits it's the same sort of thing isn't it

PP4 This image, but the problem you've got with that again is what we were saying as long as the head of the fish still wants that macho thing they're still driving it, it will still happen because that's what's expected, get rid of that and get a new head of fish that doesn't want that then you'll see a change

PP5 That's why it's like a generational thing isn't it, it's like you're graduates now will be like running the companies in 25 years' time

PP1 I still think you should go to the head of the fish

MB Yeah well I've been looking at the leadership literature and especially because emotional intelligence is sort of a, it's huge in leadership so if we can get leaders who are emotionally intelligent they might be able to drive forward the sustainability

PP4 But a lot of managers in the construction industry aren't

MB I know

PP3 They all get there by default

MB somebody leaves and then they don't want to restart so they're like well you can do that job can't you? Well yes but

PP5 Two jobs for the price of one, that's sustainable though isn't it?

PP1 I hope you're getting more salary

PP5 Not for you

PP3 I bet in 2 years of James I hope you've got a fish waiting?

PP1 He's playing the long game

PP3 Yeah that's what it is, he's biding his time

PP4 See this is the thing when I went for my first interview it was somebody who had studies psychology bloody sat in there with me.

MB It was a what sorry

PP4 Somebody who had done psychology, I'm sure it was at John Moore's was sat in there with me

MB In the interview?

PP4 Yeah

MB Did they not tell you or anything?

PP4 No it was his partner I didn't realise she was until afterwards

MB There was no sort of secret underlying thing with me and NAME, that's it's we weren't analysing you, we're just trying to use the emotional intelligence

PP5 It does all make sense though because it is all in people's attitudes isn't it, it's what's making them think about what's happening now whether that's in terms of costs or you know to changing the way the whole thing, it is all in people attitudes isn't it

MB Well attitudes are formed from your emotions as well, the more emotional attachment you've got to something that will affect your attitude towards a certain object say sustainability,, bit it's trying to do something with that in the construction field and say how do we target people's emotions and change them, might not be able to

PP1 This word is worrying me this emotional stuff

MB Well

PP5 If you crack that though why, you'll be laughing, it's the same for health and safety you know people are trying to bring in at the moment, you know were trying to bring

in behavioural safety and its changing the way people think about so safety is not just a box ticking its giving people

PP4 But why are we bringing that in? We're bring that in because we got kicked off tender lists

PP3 Because it's reactive, that's all it boils down to

PP4 If we didn't get kicked off tender lists we wouldn't

PP5 no if you go to the base of why accidents happen and why people make choices

PP4 Because the head of the fish which is full of cynics

PP5 No no no that's if you can get you know

PP1 We understand that it's the motive that is driving change and that's caused by what I said before it's to make money, not because they care, you fall off a ladder somebody else can pay for it

PP4 If RB can make more money selling toffee apples, we'd all be there with a cart

### **Focus Group 3 Transcript**

M: Can you just sort of start by telling me what you know about sustainability and sustainable development. What springs to mind when you hear those words

C: Environmental issues, renewables, natural resources things like that so its things which are long term, that have an effect on the globe, environmental issues

B: and like planning for the future and being responsible and trying to make better decisions which will impact on others

D: I think in the wider context also something which is moving away from, well conservation that kind of thing, reuse, not just something which is necessarily energy efficient all be it probably should be but also something which could be reused and therefore doesn't have to have the energy of being knocked down and rebuilt and various other things and something which can be used for a variety of things. Things which can be adapted very easily for the same reason

E: yeah I mean the agenda although it's a broad one seems to be that we're depleting natural resources very very quickly, we're contributing to the reduction of habitats in so far as that species are dying at a faster rate now than ever in the past and everybody

in all forms of life should engage in a lifestyle that reduces that depletion.

Depletion of species

D: I think in the wider context of the sites that it doesn't impact detrimentally on other issues around. It doesn't make something worse elsewhere, you know we have to think about that as the impact of a development site on the area around it

M so what you do on a local level doesn't effect on a national or even people globally

D: well potentially even the sort of slightly larger local you know you know by designing a development in certain ways is it going to down the road is it going to make things a lot worse for someone in terms of traffic or, I mean these are things which are picked up at planning stage but it. A development can't be sustainable if that's happening in the area around it. And sustainability is something which people automatically think is to do with energy and that's only one aspect of it. In sort of national planning guidance sustainability is this, what they call golden thread which runs through all of the policies and its nothing to do with energy in many cases. Its more about the right use of, it's the right thinking about reuse and new build and that can happen with low energy efficiency but it could still be sustainable

M yeah

D: as a user, as a developer

M what about from sort of the social context of sustainability. Are you aware of the three dimensions of sustainability, sustainable development?

E: well I think Simon's touched on some social concepts that where you construct something, use something you are affecting people in your immediate vicinity and people in the wider vicinity and some of those are some of the concepts like transport is it obviously has a social with this. Where you build and if you have to, if you build in a place which requires a whole new infrastructure to support that place then you are affecting the locale of what you are doing and you know I think that's one of the issues with Greenbelt. I think a lot of people will look on Greenbelt and say well we don't want to build on fields because its green space but for the infrastructure that has to go on that's to support that thing so it's not as simple as saying I don't want to just build on a field, I don't want to reduce agricultural output and I don't want to do these things. It's the other issues that its all the things you have to do to make that work and if you so we build bricks and mortar and that's the but from what we build we have

limited influence on these issues but through what we build we create, we create the use of a resource which is not always a physical resource, it can also be a resource like transport, like air use, like quality of the environment and we can be, by what we do, we can be denying or reducing the quality of the environment of the people who live around what we're building

M how far do you integrate that in to sort of when you're designing something then, how much do you factor in those considerations

D: well I think we do, we do factor those considerations in, and we have to. It depends on the scheme and the flexibility we have with the scheme because we don't always have, often it can be a very very tight brief where it's a number of units or its driven very heavily by planning restrictions. To that end, we try and have as much, we try and integrate as much of that as possible and early on at the planning stages where we do have the opportunity to advise a client of where to go with a scheme we would like to be able to integrate all of that I think in to it to be able to make our decisions. If at the end of the day the client says no I want 100 units instead of 60 as you've shown with a lovely park in the middle and a pond or something then it can't always be done and we have to rely on the planners to step in at that stage because you know it gets to a certain point where clients have certain profits they have to make on sites and the practicalities of the development and the risk that a, you know it's not always possible to get everything we want in. But saying that you know the new client policy, the national planning policy framework is something which hopefully integrates that way of thinking in to how we develop and it gives you that flexibility now, it used to be very prescriptive

E: I mean we are a service industry, I mean that's absolutely correct. And I think it's only by bringing these skills to the table that conceptual stage that you can bring agendas on to the table, some agendas a client might not wish to engage with and they are limited but also we're also members of the public and you know we have a part to play as a role we have a responsibility you know you can play an active responsibility or a passive responsibility. That's a personal choice you have to make. Commercially as Simon says I think you do, you have limited options because your client is the person who is commissioning you. I suppose if you were truly upset you could walk away from a commission, I have to say I've never really been in that position that something has



been totally unacceptable but there are degrees of acceptability. I have worked for some clients who I've been very close to those degrees but not on sustainability, their agenda

M it's very much client led then as to whether you incorporate sustainability in to the design or is it something that you would advise clients on

C: I think first of all its about educating clients as to what we mean by sustainability and that in itself is a bit of a, a bit of a misnomer because we say sustainability and they think first of all take yourselves, solar panels, ground source heat pumps. Whereas I suppose where we'd like to come from is more that holistic view of a sustainable site, a sustainable use for the site and something which can work within the wider community, like an infrastructure. I mean a lot of that eventually comes down to cost but a lot of it can be done at the same cost as you know the ideas that we would have is to integrate development site within the community it may have no cost and that's where we need to be able to say to the client this is, this is really where you should be going, for this reason

M yes

C: and often they're receptive to that and its getting past that initial stage of sustainability being a cost because its seen as add-ons, more add-ons and that comes from renewable energy really as much as anything which you can separate from sustainability in many ways

M how do you get past that stage then to engaging the client, have you come across that in any projects that you've worked , can you give me sort of a concrete example

E: I think it's, I think your powers of persuasion are, as a consultant are limited, I think you need to engage with your client's pre projects in many ways and many of the clients we work with have agendas already in place and those agendas are driven by cost. I mean we talk to clients, and we are talking almost on a one for one basis but we know the client is a corporate body of seven hundred people but we are only dealing with one of those seven hundred people or two of those seven hundred people and therefore you know you are seeing a very narrow view. But for that person to enter in to a dialogue with you, that person has been briefed by a portion of those seven hundred people to get to the position where he or she can brief you. So, but once he's in that, once that person is in that position then that person's scope for

manoeuvre is also limited because they've got to that position as a result of a dialogue and that person has only limited facility to go back to that group and say no I think it should be like this. I've just had a word with these guys and they think, this sounds like a fantastic idea. So you've got limited opportunities of doing that and I have to say most of the clients we're working with choose to engage, I mean most of the stuff that we're doing here is social architecture so a lot of clients in the social sector wish to engage so you're pushing an open door to some extent but they have got financial constraints. They're getting, they have to build houses, and they have to rent them out at a figure that the government will support. They have to, they will get, their grant will be capped at a certain level so what they know they've got a grant which is known, they've got an income stream which is generated by the government or the rental sector or something, mortgages whatever. So the variable is how much they can build for and they are, all your, you have to be mindful of the fact that if you come up with something that you realise is a good idea you've got to be mindful of the fact that the person has got constraints, considerable constraints and therefore you know you've got to be, you can't say that, other clients are more receptive you know clients they would, if the communication paths are shorter then you can probably go further with them. I think in a bigger organisation communication paths aren't short and therefore the brief that you get is tablets of stone

- C: I think though where we've had the opportunity with certain clients who've said here's a load of sites can we get a report as to the benefits of each, the constraints of each and we've done say 12 reports for 12 different sites you know on the face of it a client might say oh that looks like a great site because we can get 50 units on there and you say well actually your best site's this one with 30 units because look where it is, it's right next to a town centre, it's got a bus stop outside it's got a local medical centre, its surrounded by housing, it's got a park across the road and then we're in position then to really give them some serious advice and say this is the one you should be going to ground with, forget about the 50 units, its more units but you're better off with these two that total 50 units because both of them are very sustainable in terms of their location, in terms of the land itself. And that's really the stage at which we can, we can really make a difference in terms of advising clients. The earlier the better obviously because by the end you're just bolting on photovoltaic cells

M Yeah

C: if you can get on early and you can integrate. I'm not dismissing photo voltaic but at the early stages if it's integrated it a much better solution but as a wider concern locations and sites and that kind of thing are much more important. You don't want to be building housing out on a limb somewhere

M do you agree with that

B: yeah I don't know too much like about it when it gets to that kind of stage because I've not really experienced any of that sort of work but yeah you do have to rely on the client feeding it back to the body of people that they're with and yeah that's

D: it's not our decision I think at the end of the day is the key thing but we are in the position where we can affect what people think about things and we are listened to you know, I'm not playing it down but there are other issues which have to be taken in to account. And unfortunately for a lot of people this idea of sustainability isn't something that we necessarily need to fully engage in. It's a nice thing to say you engage in it definitely. Everyone's websites will say the same thing and the spiel that goes with projects will say the same thing but actually it needs it still needs to be a lot more integrated as a joined up way of thinking you know

M how do you think we can go on making sure that happens then?

D: well I think, do you want to talk Paul sorry, I'm waffling on then

M why do you think it is then, you say it peoples policies, they're on the websites but they don't actively engage in it?

C: I think some of them do, a lot of them, the social landlords, a few of them sort of accept that in the long term it's better for them if they can actually pay their tenants to say look this is how they use and how they manage a tenant, how they manage the buildings then it becomes more economic for those tenants to make it more affordable for them to pay the rent and everything else because they are using low energy fittings and you know saving on the powers and stuff. So it's a lot about education and how you know we can obviously promote certain things to the client who is the social landlord, it's how that is drip fed then back down to the people that use it, it's the end user which we need to educate more so to say this is how you make something economic and it can be used and be sustainable so then you're using less

water, you're water saving, using less power. You know turn your lights off when you don't need them etc. so it's all really education is the key factor

M how do you think, this was going to be my last topic but while we're on the subject. How do you think education can help industry?

D: erm

M meaning the sustainability agenda for all of us

D: it's just out there isn't it? It's making people more aware that it's readily available. The main you know talk, the buzz word is sustainability and renewables. With that people think expensive so the more competition out there the more economic it is to implement the various installations then people would be more educated and a lot of photovoltaics' and wind turbines etc. could be perceived as being a fairly new technology. We don't know enough about them that 20 years down the line is it the you know the drive for renewable, is it the correct way forward cos it's still a new product

M how about in terms of say more CPD, do you think sustainability should be a incorporated in to CPD more or how can education help

E: we're probably awash with CPDs to be honest with you talking personally

C: I think I think it is already integrated within many CPDs albeit it's kind of just given a lip service isn't it as much as anything. Yeah we need to know what percentage of recyclable is going to break that someone's manufacturing that's fine. Recyclable materials are becoming more important but it's only half the, this isn't really talking about CPD but it's only really half the story. Because to recycle you need to use more energy you now so you've got to, you're sort of got to balance these things out but CPDs are becoming more aware. The CPDs we undertake which are, we do lunchtime seminars with manufacturers and suppliers and one session of that CPD if its and RIBA approved CPD is to do with sustainability in its wider form. And it's interesting to know but again we've got a role to play in that because a lot of its common sense. From a specification point of view which is where we can affect what we do and the impact that our schemes have. You know why would we specify something from Holland if we can get virtually the same thing in Chester you know it doesn't make any sense. But we still do it because there's a preference and you know these are things which

have big impacts really. You know the embodied energies and materials, where they are coming from, what energy they take to build is a big thing

M why would you say that's the preference though if you can get the same in Chester?

C: it's not always the same but it's virtually it. Like for instance there's quite a big brick factory in Manchester. NAME have a big factory there but you know people still specify bricks from all over the place around here. And in many ways you know that's a good thing. But if it's a brick for a bricks sake or a bit of plasterboard then why specify it further away than you need

E: because you've got all the transporting costs of that. The other question I always ask, or find myself asking is you have all these comparison websites now and what I've often wondered is if you go to a comparison website and one of the comparison websites says all our electricity is generated by renewable resources but you have to pay 20% more for that for using that electricity than another website which says we buy our electricity as cheap as we can from nuclear power, coal whatever it doesn't matter but your electricity bill will go down by a, will be less by 20% by those people I wonder talking about how many of the general public would go, would be prepared to put 20% more of their money in to that purchase and my personal feeling is it's not a lot. I think there's a, I think you have an issue where you have you know you have people who are interested it and will try and deal with it and try and mould their lives around sustainability and try and be as sustainable as possible but I don't know where, and it's probably for all of us, is where our barriers are you know do we want to be sustainable, do we, what will we pay. What will we personally pay to save the planet? What will we give up to save the planet? You know so I think there's. And that in a way is where we come from with buildings you know. What can be done as commercially possible. I think in the private sector they have, probably more of a problem in a way. I'm not sure really why they have more of a problem but you know when you are sort of building an office block and the factors are capital costs against running costs so if you can prove to somebody that your running costs are cheaper then you can afford to spend more on your capital costs because it's just a bit of accountancy. But when you are trying to say to somebody well your capital cost is X amount because we are going to buy all sustainable materials from all these sources but we're not really saving you an awful lot of running costs, the running costs are roughly about the same. How

many buildings would be bought, how many clients will say well yes I want to save the planet therefore I will do that

M so unless they saw some cost benefit for them

E: pardon

M unless there's some sort of cost benefit

E: well it's a

M you want to give them hard evidence of that

E: yeah

M and where the returns are going to be

E: I mean projects, big projects are always done on cost benefits analysis basis hence the question of how you weigh those things which are not, those things which don't have pounds attached to them

C: it think going back to education though it's something which I mean NAME probably better placed to say about it than us at the moment but when I was at uni which wasn't really that long ago it wasn't an issue, it wasn't something which was considered

E: no

C: as part of your design briefs, it's not something. I don't know if that's the case now whereby I mean talking about I suppose energy efficiency and things like that, is it something that you genuinely have to consider

B: no it was, it's outlined in the start of a brief but the tutors and everyone just sort of add it as a bolt on at the end

C: yeah

B: where you've done your design, you've everything's all finalised then you're like oh no you need to do a sustainability element now quickly go back and figure out how you can put that in. It's on paper it is to anyone

M so it's not being driven through the curriculum then

B: no its there as a tick box but it's not really factored in as much as it could be I don't think

E: it's strange actually that because when I was at university we went through, my aim of cost I went through university at the time when the first wave of hippies came on board and alternative cultures and stuff like that but it was more of a cultural alternative society. Yes there were wigwams and there were dome structures and

there were back to nature and looking after yourself but it was more of a, it was more of a social statement at that time than a sustainability statement. It was a life choice rather than sustainability choices. Cos yeah it's strange that

C: well to me nowadays one of the big things is creating sustainable communities which has nothing to do with energy, it's about towns and villages which continue to be towns and villages in fifty years and not have to have any real outside input funding etc. just to keep going you know, post offices and things close down these days cos there's just no call for them

E: umm

C: but there still is in the sticks, in small communities and it's a very sustainable thing to have but in a town it's not, generally in a big city these things don't seem to be. But you know that's something which, Master planning was always something we did at uni. And that's really, that's gotta be the key consideration these days. You know we see what happened in the sixties and a lot of it that's been pulled down and ghettos and various other things which are built. You know this is, these are the opposite of inclusive sustainable communities

M what's Master planning Sorry?

C: oh you know large scale design over, design in a town for instance or a part of a city. That you know which needs, you know with cities to integrate them within the existing city it was always that, which is sustainable in its own way. Maybe it's just becoming more and more normal to do these things now whereas in the past you look at some things which were proposed and some things which were built, they did the opposite. You know they created boundaries between places and now we're trying to open everything back up again. You look at Liverpool One for instance, it's been a great success. Really it's just built on the existing pattern of the city and as a result it feels right and it doesn't feel like it's a completely different part of the city. So in its most basic form that's what it is. Liverpool One was Master planning, it was

E: simple things though that that not many years ago our cities were going to be pulled down or large parts of our cities were going to be pulled down and new housing was going to be put up and they ran out of money so all those schemes got shelved and now as I was saying well now all refurbish large parts of our city but refurbishment is a sustainable form because your infrastructure is all there for sustainability and your

schools are there and your drains and your services are all there so that's a very sustainable. But that's a Master planning issue really you know in. You know not but you know terraced houses doesn't work socially very well anymore but you know there's the balance between do you pull it all down and start again or do you do you improve through increment like Liverpool One. Maybe there's a magic there that, maybe those street structures which were there had something about them which not really sure I personally understand but I agree and not just because we're next door to it but I do agree that in terms of places to go it's a very comfortable place to walk in to and be which I think is one of its successes. And I think maybe there's some sort of magic goes on there

D: but equally Liverpool One could have been built as an out of town park

E: yeah

D: it would have had virtually the same tenants but you wouldn't have had, and it probably would have cost a lot less because they couldn't command the same rents but also the amalgamation of buying up all that land was probably was pretty pricey. I don't know what it was but its prime city centre stuff. But at the same time they took a punt on it and this is the difference between going the safe route and you know obviously we would always advise in that case if we were given the two options as you say you've got to stay out of the city. You've got the trains, the buses, you're next to the Albert Dock, you've got all the restaurants around it, and you've already got that mass of people there or thereabouts. And that's a small decision in the scheme of things but it has the biggest impact on everything

M so from a risk perspective it's safer for them to stay in the city where you'll know that they'll generate income and get the return on the

D: well yeah because the people are there. If you take it out of town it's cheaper and you're relying on, the Trafford Centre for instance, you can't say that's not been a success

E: in actual fact

D: that did the opposite took in out of Manchester

E: that was the model wasn't it over those years there were models, lots of models where you had Trafford Centre, you had one on Newcastle, Gateshead, I don't Mere Park or something like that and that was the model and I think it was obviously brave



by the Grosvenor Estates estates to say this and what we're going to do. They had no pattern, they had no finite knowledge about doing it but having done it they've created a very sustainable I think a sustainable town. They sustained the town because obviously all the places that are not in Liverpool One are still, haven't suffered quite as much as people expected. But it's there, and it's, I mean from a transportation not having to build huge car parks

M yeah. Just, are you on placement are you NAME

B: I'm on a year out before I go back to university to finish the rest

M oh ok

M do you find that on all your modules sustainability is not integrated as much it's just an add-on on

B: well we do have sort of environmental science exams and modules in that sense where you're taught about various ways that you can integrate it but that sort of stays within that module and on paper it's supposed to be part of the studio module and when you're designing your buildings but I don't know whether it is time constraints or because the tutors haven't got as much input as they would like to cos obviously from my point of view we don't, we only know what we've learnt in the lectures and it's the tutors who have the opportunity to guide us with it but because there's so many other things going on it does kind of get pushed to the side but I do think the further you go on with the course like in the masters it is, it does become more of a focus

C: it is a balancing act really, with architecture your first few years your formative years at uni are about trying to, I mean its design as much as anything I know that comes in to design but really you're really trying to bring or the tutors are really trying to bring out the best designs in people and they get them thinking in the right way so I mean it's not a disaster that the degree doesn't have an awful lot of it albeit the modules should still be there. We had modules on sustainable energy and things. It was that bridge between those modules and sitting in a lecture and being told about how it works and actually integrating it within a design scheme that you are working on. That's the only way you'll learn the best about it but that's it in its very basic form in terms of energy saving and that's. We should have people coming out of uni now saying well why aren't you doing this to these houses

M are you not finding that

C: no I don't think so

E: no

C: I mean I must say though in terms, we do quite a lot of social housing as Eric said and its moving quite quickly in terms, there's a lot of things being tried and trialled to really try and reduce cost it has to because of benefit reforms and grant levels and various other things. We're doing a few houses on a much bigger scheme which have no radiators on the upper floor and it's all done through mechanical or ventilation heat recovery system so it's just pumping warm air around basically and extracting at the same time, and that has a saving in terms of energy but it's trying to get people to buy in to, for future tenants to buy in to the fact that there are no radiators, they don't need them but people like to have radiators and when they're cold they like to turn them up

M conditioned

C: but these houses are built with so much insulation in the walls and so airtight that you never have to turn your radiators on anyway. But it would be nice to be able to hang your wet towel on something in winter. You know there are these issues, practicality issues

M so do you think it's about changing people's perceptions of that then

C: very much so

M how do you think we might go about that?

C: education in its simplest form

M it just needs to become the norm

C: talking to people about it, and I understand these things need to be made a lot simpler than they are now, a lot of these things which are integrated are a little bit difficult to figure out you know for a lot of people. And I know that the housing association that we work with mostly go to great lengths to sit with the tenant and say this is how it works and this is why you have to do it. Not just hit this switch when you need a bath, you say you've got to hit this switch because this is what it's doing, its creating the hot water you know if they go I'm not going to do that and find out they've got no hot water and then ring them and complain and say you know why didn't you just put a normal combi boiler in or but it is the education. And we're putting things in like switches which bring all voltage in the house down by half you know for when maybe

when you're away from home or you're out for the day. And all these things that are running constantly are now running at half the energy that they need. So there's things like smart meters which tell you how much energy you are using at any one time, they're great because you may as well just be looking at the pounds that have fallen out of the back of your pocket when you look at that and you say well why have you got so many lights on upstairs, I've just lost 60p in the last hour. You know when you actually ground it to money, and that's the important, it sounds terrible that but Eric has already said it basically it comes down to cost

M from a commercial side though how can you get, you can do that with tenants and install the smart meters

C: yeah

M I'm focusing more on the commercial side rather than the housing side so how might you sort of get the same effect but with the commercial industry

C: with the larger commercial buildings you have a building management system generally which controls a lot of your

M that's the end user then isn't it?

C: yeah

M rather than the

C: it is, well there's a thing at the moment, I went to a seminar I think a few months ago now and it's called Soft Landings and it's about, it's about educating the client through, it's basically it's like a contract, it's a building contract really but at the end of the contract you allow to be involved with the client after handover. Because often its handover bye bye client

M are you all aware of the new government Soft Landings, have you all been on the training, like seminars

E: no I think it's only Simon's been on the course

C: were you not on that, you mustn't have been there Eric

E: no but I know what Soft Landings are anyway

C: well you know what Soft Landings are so you know that that's education inside of it

M do you find like you attend a seminar and you're saying to Simon you know go off to the seminar come back feed it to everyone and that's how you gain your knowledge of these issues

C: yeah we agreed, generally. I mean I came back and had a chat with NAME cos it was a really good seminar and it explained you know what the principals are. It's quite a big thing at the moment and it looks like it's going to be brought in with all capital projects in the next few years so we need to know about it. And its common sense again, it really is. It's basically not walking away from your client when you've finishing and explain, but also its about tracking these things because I think a lot of it has come from the Building Schools for the Future where schools and the government have committed a certain amount of money and then they've got to a stage where they say well we can't afford the running costs of this. And they go back and they say well why is this so expensive because you said it was going to be sustainable and it turns out that either things were installed incorrectly or largely it's an educational issue where people are running three things which are doing the same thing all at the same time so they are paying three costs. And if there was this thing in place where say the month after a school finished the architects on site, the engineers are on site, the M&E guys are there, the installers are there to all sit down and have meetings daily to discuss what's going on. What's not been working. And then at the end of it in theory you have this master information which is saying this is how it's running and it's not quite, it's not quite running how it should be at the moment but this is why. Instead of finding out two years down the line that its costs ten times what it should for those two years and then fitting other stuff to make it work. So you know that's an interesting and in its own way that's a sustainable issue

M Yeah

A: that's almost Post Occupancy Evaluation isn't it?

C: Yeah

A: is it plan M within the RIBA, it used to be

E: it is, there's different numbers now

C: they've changed it now

E: yeah

A: and then it just feeds in to more the Facilities Management side of things and then they try to find the solution to what isn't working

C: yeah its

- E: well I think what NAME says is true in that it didn't happen in the past and it has to happen now and Soft Landings is one of the issues that we've got that buildings have certain procedures, you have practical completion, you go around making sure that everything is hanging on the walls and the paint's alright etc. etc. and you give three sets of keys or the keypad or whatever to the owner of the building and that's it done, job done. And historically there was no feedback after that except possibly by the client's maintenance personnel. And that was the last you knew about it. So in actual fact you could, any mistakes you made there you could well go and repeat again because there was nothing whereas with this process first of all you have the dialogue with the end user, not and the end user isn't always the client. So you have the dialogue with the end user and you start and then have a chance of improving your product and next time it will be better than the last time because as I say you, you know you have that dialogue coming back oh why did you do this cos this happens. Commercially, people said you know they get on with life cos they have to get on with life but they think it's a load of, one issue or something like that is a load of rubbish
- C: yeah it's learning from your mistakes which is another pretty basic principal but one which is always talked about with buildings is the car manufacturing industry. You know if you've got a car that has a fundamental issue like the boot lifts up every time you go over 50 miles an hour you know it gets changed pretty quickly
- M yeah they'll do a recall and they can't recall buildings
- C: and it will never happen again
- M yeah
- C: and you know in our industry unfortunately we can't say that that doesn't happen. People make the same mistakes again because, for various reasons you know. You might be required to put say solar panels on a building because it's a planning issue and it might be a north facing roof, it's not going to work very well, maybe 20% efficient. But no one really cares about it because you've satisfied planning
- M so its box ticking
- C: in some ways yeah. In many ways
- M and do you feel the industry does do that, it will just box tick and only meet sort of only the requirements that it's expected to go through
- C: yeah

M sort of BREEAM and LEED

C: it sounds bad saying that but I mean yeah BREEAM and then in housing you've got Code for Sustainable Homes, you're talking about box ticking exercises. Stick a shed in the garden you know cos you need somewhere to put a bike. That's it

E: you pick up the points

C: you get the points

E: you get your points and you've got your benchmark and off you go and you know

C: that's always been it, prior to code for sustainable homes, I know it's sort of commercial here but there was ECO homes which became Code for Sustainable Homes and now they're looking at changing it again and they said when ECO homes was going out that the next one would be less of a box ticking exercise, more of a holistic approach to sustainability and it isn't, it's not helping anything in terms of sustainability really

M what do you think would, do you think there's too much change

C: it has to be driven by the planning system I think. I think those, the big decisions have to be driven by planning. The medium sized decisions have to be driven by planning, the one off stuff isn't having that bigger impact anyway. The bigger stuff is being let slide at the moment in terms of sustainability. The smaller things like make sure you put an energy efficient light bulb in 80% of the property, but at the same time you can be living next door to a car showroom that has no regulation in its lighting so it doesn't make an awful lot of sense in that respect it's all very well, a dead easy place to gain Code for Sustainable Homes does it. But as a wider principal, and this is what the NPPF is supposed to do, that's your planning policy framework which is a step forward I think in terms of delivering sustainable development

E: I remember talking to a property manager who's just commercial buildings and this was what 18 months ago, 2 years ago he says Eric he says the use of electricity in this building in comparing with the total cost of running the building, the capital cost, repaying the mortgage all that, he said it has no consequence to me that how much this building, how much energy, how much electricity this building uses because in the total the total the total costs of everything that factors say paying back the mortgage etc., maintenance, staff etc. etc. that bill is of no consequence he says so why, why should I worry about the fact that this building is energy efficient, it's not relevant. His

point being I add in fact he was playing the bad guy because it was what he had been led to believe he says in actual fact he says it's the energy is cheap, it's not expensive he says in the scheme of our bills in terms of what we pay and our costs of living you know when we sort of say well that's the tax, that for this, that's our clothes, that's our transport that's our mortgage and then say well there's the electricity and gas bill its small beer but that's why I think you've got to look at the whole thing holistically and it comes down to what kind of society you want to live in and in a way that's why the argument that the democratic system should be, he says you should have people saying that this is the society that you as a populous want to live in don't you and therefore this is the structure that we'll set up because that's where you want to live

M so there should be more of an emphasis on the social side of it and maybe engaging communities more to say you know what type of society do you want to live in

E: well I think

M do you think they should be involved in the planning process

C: definitely

E: yeah

D: it's fundamental it's more important than anything that communities are involved in planning and take over ownership of decisions because it's one of the biggest problems that unfortunately we live in a society where people would rather have nothing being built than something being built near them in many cases. We particularly find that with social housing because of many of the stigmas associated with it. But the more you involve, again I went to a seminar last week about community involvement and that was great. It was you know, it was nice to hear that people want to take ownership of schemes as a community but in the first instance they kind of want that to happen anyway. You know it's always, it's nice to have a park near your house. It's nice to get involved in to which roundabout goes in to it but when you turn up and say we want to build 70 houses behind your house they just say no. It doesn't matter how, you know. It doesn't matter if its 10 or seventy they just don't want them

E: also the other issue you've got to ask yourself is in a way and I'm not sure, I'm not sure I know the answer to this is does the community want to be involved in it now, obviously you've got the community which is and once again I will go back to social

housing but its anybody who rents is, there was once upon a time a movement for co-operative housing and the idea in those co-operative housing is the idea of co-operative housing is a group of people would get together, not all social, a group of people would get together and they would create their own environment, certain parameters obviously because you're never that in control and that was a way of creating communities and it's fallen by the wayside entirely now that, I don't think there are any co-operatives actually that I know of any way that I know are actually being built. So the question then is does the community really want to be engaged and I don't know. I think they do but that what evidence of it where you actually, I mean Liverpool's got the best, one of the best in the country with the Caledonians. And it's probably I think as far as I can understand because it's something that interested me is it probably one of the best, most successful co-operatives in the country. Recent times you know I, but yet it's a movement which is finished yet those people have chosen to engage

M how do you think industry can help make communities engage more?

D: I don't know they can. Industry in what sense

C: it's gotta be driven by the government and the government

M I was going to say the government obviously is one of the biggest clients with construction, obviously drives a lot forward and it has to obviously cos its government but do you think its solely government's responsibility or should industry be doing more to actively push the sustainability agenda

D: government should drive it forward but it's for the industry to come back and say how the economics work for it to work for sustainability is good for local, is the local gains, is it professional gains, it's in the government's vested interests to say well do we source locally or do we go, improve our international relations and outsource materials from somewhere else because they can get it cheaper, there's more renewables, its readily available over there whereas we've got a finite limited gas reserves and everything else so

C: it's always going to be driven by markets, forces you know in that respect. You don't get it, no one can change that. The government can potentially try and change it through policy and grants but

E: well they do through grants don't they



C: yeah grants are the biggest things of change

M incentive use

E: yeah grants, well incentives are grants I mean you know I'm told, I don't know for a fact but all the, all the wind power stations are not, they don't pay for themselves. If they had to be, they wouldn't get built if the electricity, if the only factor that was paying for them was the electricity they generated. They only get built because of because of the fact that the grant and social housing only gets built because there's a grant there, the rents don't cover the construction costs although from what we're told we're going to get quite close in the future aren't we

C: yeah yeah that's the plan

E: but you know I don't wish for a big brother society, the government through, not withholding and spending money just through regulation can control so much

M do you think that's what it needs, regulation and more legislation to drive it forward, it's the only way it's going to change

E: yeah we don't want to say that

D: it's starting to, the code will try and draw the levels up. At the moment code level 3 we should be level 4, level 5 but because the government haven't implemented British procedures with you know we're 2, 3 years behind

C: it is starting I mean that's one of the big, the big changes that's going to happen in terms of building regulations is its gradually ratcheting up the level by which you're going to have to hit to build a new home. Eventually getting to code level 6 envelope that is, forget about sheds and gardens and things like that. But if at the moment you have to build to code level 3 energy efficiency which is an improvement of thirty odd percent of what we used to have to build. If that keeps going up then for new housing it's going to, it's gonna be a good thing but what do you do about the rest of the stock. You know there's an awful lot of houses around. It's good that that's happening but what's happening with everything else. You know it's a small thing really. Housings a big thing generally but new housing isn't really in the scheme of things gonna have a huge impact on our energy use. So you're going to have, I don't know maybe a couple of million people living in brand spanking new homes in ten years which are really efficient but what do you do about the other 25 million

M are they the existing stock

C: the existing stock

M for refurbishment

C: yeah

D: cos the government or building control have what they call consequential improvements whereby if you refurbish a building you're driving it up to the current standards which is new build but if you can't then there's a sort of compromise or concession cos that person could say look we've just can't afford to refurbish it cos obviously with an existing property you have limiting factors, you can't thicken the walls out, change it, put under floor heating and various things it dictates by what services you already have so on you know existing housing stock we see around here people have started to introduce external insulation cos we're trying to upgrade and refurbish to improve the thermo values and everything else that social housing are trying to do to be seen, a lot of things the government and code people call it eco bling because you can see, you can physically see something on a build like a wind turbine or photovoltaic to see that you're being sustainable and eco-friendly erm but the main drivers for the new ones is the hidden costs is the insulation, it's the stuff you can't see which has a better influence on energy saving and costings but a lot of people term as eco bling because oh I can see a solar panel there it means you must be doing something but it's not as it can't be seen as being as environmentally friendly erm in that way so

E The other things you've got to bear in mind also is the Government is its positively discriminating against refurbishment because its charges you 20% more to refurbish a building than to build a new one so the Government is actually making a decision to disincentives refurbishment because you pay VAT on refurbishments you don't pay VAT on new built so there's that

M So it needs to take that

E It's a huge disincentive to think, I mean we've been in situations where it's cheaper to pull down and rebuild than it is to refurbish because of the 20% surcharge

M That's a major issue especially when there is so much existing stock

E Exactly if you go back to Simons point which, it's a huge issue

D You've got historical buildings and listed buildings what can you do there, you've got red tape and the conservation people saying keep it as it is

- M So again it's about government maybe dropping those penalties and
- C But you're not going to get people refurbishing if the costs don't stack up is the bottom line and the costs don't stack up for those reasons in many cases, the fact A, you've got to pay your VAT and B you've got to basically build it to the standard of a current new build house, by bringing it up to that level with consequential improvements, so it doesn't make any sense to refurbish anything in that respect because it's costing you a fortune and as Eve already said erm refurbishing a building is one the most sustainable things you can do.
- M But yet because it costs more people wont
- E Well the thing is, the thing that Simon was saying about bricks before, the embodied energy that's in a brick, the fact that it's taken, you know you've had to get the clay out of the ground put it into a kiln, fire it up and then move it from one end of the country to another end of the country then employ a person to put it into place and stuff like that it's just a huge amount of energy in that brick in that house and then to say that its then 'worthless' because there is a 20% tax on it, on reusing it's got to be bad, bad governors, bad economics
- M I keep finding when I talk to people that industry is very sort of reactive and not proactive you know so say to the government soft landings, how reactive do you think industry have been to that, do you think it's something that will just filter in
- C I think it's something people will do when it becomes necessary for them to do it, like if it becomes a requirement for capital (PUBLIC) projects people will do it
- E mm
- M Like BIM
- C Like BIM yeah exactly
- E Like BIM, I mean it should be something like BIM, I mean I'm the least computer literate probably in this room but something like BIM is so obviously a good thing to do but I think without the government saying that it's got to be in place by 2016 it wouldn't have happened, the industry I mean we'd love to believe that the industry is a dynamic industry say like the manufacturing industries have to be but it's not and I think without regulation unfortunately it does seem like this industry needs incentivised regulations, something to move it forward and I think even though the arguments for BIM are self-evident I think it would have taken a lot longer to move

forward without the Government mandate of saying well if you're not compliant by 2016 you won't work on any of our contracts, yeah well you know that people's attention

M You think we need more incentives like that, well you said industry maybe won't be ready by 2016 why do you think that is that they're not, you know government have said by 2016 and they're just like oh well we've got 3 years lets deal with that when it comes to it, why do you think industry takes that attitude towards it

C It's the economics of the moment, I don't think its industry I think it's economy I think from what I understand because I don't really understand the rest of the economy but as far as I understand it seems like our economy in terms of investments everything has an issue of short termism in it so that people invest in short term, the only people who really seem to have a long term investment strategy are manufacturers, investors don't who are told at the stock exchange are the people who move money around it's the, it seems only that manufacturers because they invest in plant and equipment and machinery and the payback for that is several years, they take a long term but it seems like the rest of society is short term and the construction industry I think possibly reflects that. Maybe we're not that bad really in concerns of how society is. Maybe we reflect it more accurately than the manufacturing industry.

M Do you think maybe BIM and Government Soft Landings should be more integrated into the curriculum so that when graduates leave they're aware of how these things work and able to integrate them into projects

F Yeah

M Do you find sort of once you come into industry it's completely I mean it is in any sort of I know myself psychology is not what I thought it was going to be when I left university but

F Yeah I mean I think I was lucky that I did come and do some work experience before I got to the end of the degree but for people who haven't had a chance to do that I reckon it's like a smack in the face I don't understand so things like BIM that was mentioned maybe 6 months ago to us like by the way this is what's going to happen and unless you've had the time and you've researched it yourself you sort of rely on your tutors and the university to prepare you for what's got to come because you've been so spoon fed through school so

- M Do you think maybe the curriculum should focus more on sort of the practical side of it like that rather than, I know architecture you've got the design element but sort of that should be a major factor because when you come into industry that's how industry operates now if you're going to be expected to use BIM on all your projects then you should learn it at the curriculum level?
- C I think the problem is though, a lot of universities rely too heavily on the two years out to educate the whereas industry and Eric may well say this is that actually when students come into our way, he's sat right here, when students come into the practice and I was the same when I did my Part 1 year out, you don't know anything about how the practice runs, you don't know anything about construction in many ways which is fundamental but you know all the, you flounce about a bit your first 3 years trying to find your design muse I suppose which is important in many ways but there's a reliance I think on that year out and as a result when the curriculum is planned, they say oh well they're going to learn that on their year out and actually you know the people who are employing them are saying well why aren't they learning that in the first 3 years
- M Yeah, do you think there should be greater collaboration between university and practices such as yourself?
- E God yeah, I was in a group and as NAME says they were there to do Part 3 examinations and it was just after the nice £9000 tuition fee comes out and it was a part 3 and I think there was about 4 of us sitting there and one of the students saying I feel like suing the university I went to because how ill they prepared me for the life of work. He said I've been there for 5 years, I've paid £45,000 fees and I've got a degree but I've just not been prepared, it's as NAME says the reliance in architecture is that it's all post grad stuff and as I say this young man was getting quite heated about this issue having paid £45,000 and having been short changed he feels, he felt quite strongly, I don't think he did anything about it but he's obviously, but I think he was that next to picking up to his solicitor saying I've been cheated I've been miss-sold and education I want my money back
- M I bet many people feel like that especially in this climate.
- E I thought well that's an extreme view of it but nevertheless its but there should be more integration between universities but the thing is fair do's to universities just to

carry on that and I broached that with erm erm goodness me, Brown, Andy Brown at the university and he turned round to me and he says well you do you know how many were tutoring you, how many students were there in first year when you went to university, Liverpool university same university NAME went to, how many people, there were 50 students in first year, how many of that 50 graduated together in 5<sup>th</sup> year as we called in then, I said there were 16 so that was the number and that was the dropout rate and he says would you believe that the number of permanent staff that we now have at the university is the same as you had then and what's your first year intake?

- F 100 well when I did it was a 100 but it's now 200 about 150 200
- E Yeah so double the intake don't know what the outtake is in terms of the fallout and the staffing is still the same so when I'm criticising about the quality of the technical education at the university Andy's pointing out and he's a very sound person erm and he's saying oh you know hang on E you now so many hours in a day here
- D Where's the £9000 per person going every year that's the thing isn't
- C The fees have gone like that (up) and actually they're not employing any more people
- D No
- C The last year I was at uni there were 12 of us in that, in the 6<sup>th</sup> year and there were 130 in 1<sup>st</sup> year and that was the first intake of this kind of number and we had to move to a sports hall basically to accommodate err the first year but there were no extra tutors, they didn't take on any extra staff they just took on another 100 students
- F It's just frustrating because you want help and there's no one there
- M Do you feel like impacts on the sort of amount of help you get then?
- F Definitely,
- M so if you had a question about sustainability you feel like you wouldn't be able to go and ask about it
- F You get told well quote "don't talk to me about the environment you've got 10 minutes with me this week let's talk about how your building stands up or what that room looks like inside don't talk to me about fire escapes and H Vac systems we haven't got time" so then I'm thinking ok well is that not priority then and then you get to the end of it and you're expected to know sustainability but then there's only

so much you can Google only so much you can bring in from lectures without having someone explain to you why that actually works in reality but then there's no time

D I think though playing devil's advocate though if you have a series of sustainability lectures what's the difference doing it to 130 people instead of 13 people you just have a bigger room to do it in I mean I appreciate the tutor, and tutoring is an important part of the course if its, well it's probably the most important part of the course, but to be able to get that information across and to explain how this can affect your designs, how it should be integrated into designs doesn't take a load of people it takes one person talking to a lot of people potentially

E But at the same time in times gone by I mean the guys were there and you're in the studio because some years don't like to work in the studio but we did and the tutors come round and talk to you and look over your shoulder what you're doing etc. etc. and all of a sudden there's a group of you together chat, chat, chat, chat and you move away but the problem is ok you might have a work to rule situation like I've only got this and I've only got that and I've got to do a research paper as well because otherwise I'm going to lose my position and the university loses its funding and all this kind of thing so the pressures are all there but the funding isn't there or doesn't seem to be there at all because, I don't believe that they intention of the educationalists has all of a sudden changed, you go into education because its partly vocation and long holidays

D That's when you do your research

E Of course we know that

M How then do you think university and industry could collaborate together better to drive sustainability forward then, what do you think that they could do together, so for me I've got to go away and over the summer develop these educational interventions, go back in September pilot them with students and if they work take them into industry somehow I don't know but this is what the purpose of the focus group so I'm trying to ask you as industry what it is that myself within an educational institution can do

E I think you, I think in a way I can't tell you what to do I haven't got your experience but is get more outside people in as because people like to tell other people what they know, it's something I think we all enjoy doing, so getting outsiders in is great, it's

going to more sites, I mean when I was at university, I don't know what the situation is now, but there was a real health and safety problem even in those days which was an awful long time ago, health and safety of taking students onto building sites, you can only do it in small number anyway because otherwise it becomes stupid because you can talk anybody erm and the other thing which we always get alluded to is the car industry, how great the car industry is well, erm why don't students go down to Halewood and see how great the car industry is there they let you in, you know as long as I think it's about 20 or 50 well that's a big difference in numbers but they'll let you in and they'll show you see how just in time works which is supposedly a big deal in the construction industry and there actually is just in time in at Halewood and so it just feels like education has got to be a bit more dynamic than 10 minutes of somebodies time to answer a question.

C It's all theory and less reality

M There should be more project based work?

F If you could make people go in for like one afternoon a week into practice I think

M To somewhere like this

F Yeah maybe that would annoy the practice in the sense that that person doesn't really know anything and is asking questions and stuff but I think, I don't know over the summer when you're not there and stuff you need to be in a practice and continuing it and learning what it is really like and I think it should be a requirement or another module or something like that and I know that is more work but in this sort of a degree you can't just blag your way through it anyway

M Would it not be of mutual benefit though because you're taking what you're learning in university into industry and maybe teaching them as well so the intergenerational

E Works that way absolutely that's, absolutely true, I mean you know the skills that students come out with you know the drawing skills the computer skills all those kind of things are in many cases along way ahead of what we're doing. When I get a student CV in and I see all these things which I can't test them on because I don't know how they work but they can use this kind of software that kind of software now there's you know because were all heads down doing projects we don't develop those skills because we develop the skills that are necessary to take the project to the next stage unless you have a vocational interest so there is a lot of stuff that can come forward I



just feel like there's a barrier. I have to say I think architecture does it better than most, not ourselves because NAME is the first student we've had on a for a couple years but there was a time when we doing it every, all the time

D We had one last year

E Pardon

D We had Alex last year

E Oh yes of course we did I forgot, erm but it seemed a bit big

C she obviously made an impression

E She talked a lot, I don't know much information you partake but anyway but erm I think there is that, I think architecture doesn't do badly because of the way its structured in terms of 2 years, I think I don't know how all the others, I mean the other thing which has gone is the idea of day release part time education, it seems like on building they get more of that, not so much trainees because there obviously is an apprentice scheme but even with project management you know you talk to a young project manager and you find he's on a day release err doing this and maybe the building industry maybe contractors are better sorted out as far as this is concerned, the relationship between themselves and education and maybe they see the investment in that persons I don't know how the wage structure but maybe they see their investment in that persons education because even if they're not paying for it they're losing that person from a time point of view so they're paying for it somehow

M You mentioned there was a barrier stopping that happening, what do you think that barrier is?

D Workload probably

E Yeah partly, I mean basically that's one of the reasons why we had a break between taking on students I mean we, even when there was just myself and Mike there was just two of us there was a student and so then it grew and grew and there was always a part 1 and part 2 student it was just what happened, one went and another student came and then it almost seems like I don't know whether this is actually fact id have to look at the book but it almost seems like 2007/2008 we thought no we can't afford this I mean I had a word with erm NAME in terms of costs and how you monitor costs and projects costs and stuff like that and there is an issue with that for the practice there is a cost to the practice in taking on a student I have to say that I do think there

is a gain as well, I think maybe for those when we had that bad turn and we downsized and we actually had to let people go at that time, you know think hang on I'm letting 3 people go and I'm going to take on a student, no that's daft that you know, I recognise my own responsibilities to the profession but how can you let a person go, sack a person and then take a person on in September or June, July, it's just it's not sensible it's not a think you would do, it's insulting

M Yeah, yeah it's been hard for the industry the past couple of years hasn't it

E Yeah

M I'm not sure there's anything else really. How do you think University and Industry can communicate better that collaboration, what do you think would work as a communication tool

E Well you have visiting, do you have visiting tutors, visiting lecturers visiting anything

F Yeah every time there's like a big crit or something like that they'll get people in that the tutors know from different firms and things like that but because there are so many people to go round you don't really get a chance to speak to them afterwards and they kind of if they see someone they like they'll give them a card and give them a job and that's how it works but you don't get to talk to them on a level like that unless, like I was very lucky in my last semester I got a tutor who works four days a week in a practice so at lunchtimes we could talk to him about how things work in the firm and stuff like that

M So better networking opportunities

F Yeah

M Do they have you know, there's obviously a lot of networking that goes on, do many students attend these events or are you sort of student members of the RIBA and RICS and the CIOB or

C I was a student member of RIBA when I was at uni

M Did you attend many events?

C You didn't really get invited to many to be honest, it's not like now you get invites to loads of stuff you know as a chartered member

M Do you think that they might be something that might help if students go along to these events and they can network and share their ideas?

- C You know it is actually a good idea, the problem here, I mean the networking events are largely free, it would also be good if students could attend some of the seminars, the seminars are useful, the RIBA ones and they're rarely full
- E That's a point actually, you're right at John Moores
- C And they're at John Moores Uni
- E Yeah
- D There actually in the Art and Design Academy, you know so it's, that's perverse actually,
- C If there's empty seats just go and sit in
- E Well they, I mean they could even probably I don't know what their final year is or what their final 2 years are but I bet you there's enough empty seats there to take one of those 2 years wouldn't there? And bearing in mind that things are on either law or conservation or industry issues, they're not sort of esoteric stuff.
- M Mm but that's a great opportunity for students to meet professionals and network and engage
- C Yeah it is
- E I'll pick that up
- F Well then people need to enforce the bigger as well because I know it's all good and well saying that but to the people who I was with in university if you said right there's a seminar on 2 buildings away for 2 hours now on conservation they'd be like are you having a laugh this is I've got to sort out this roof and you've got to think well no think of the bigger picture like when you go to practice you're going to need to understand at least some kind of grasp of that but I think the tutors need to be supportive of that as-well rather than just here is a flyer you can go to this kind of thinking.
- M Maybe build it into the curriculum somehow because it is educational isn't it so its
- E Well we go to , Andy Ross that was the name I was trying to find out, building department, I mean we through this Best Practice Club erm we get invited to buildings at various stages during their progress and its interesting you know you go there because you like it and its interesting and it's all that kind of stuff and we went to the library when it was being demolished and we went back again when it was all built and I think well that would be good stuff for students because what they're doing is they're seeing the process and what's particularly good is that the contracts manager

is standing and he's telling you all his problems and the problem with architecture is, well the problem with all of us in all the industry we're very insular, yes we know what we know and we think we're not but we are but when somebody's telling you know well I'm building this and by the way I had to put, I didn't know this but I think it was interesting so I'm telling everybody, but he had to put in acoustic and vibration monitors in the 2 adjoining buildings when he was demolishing the William Brown as it then was and if they rang demolition contractors stopped and bearing in mind the demolition contractor was costing X thousand pounds an hour in terms of plant machinery etc. etc., him stopping was a crucial factor in choosing the way that it was demolished, in actual fact they started off ball and chain stuff and then had to stop for a month because it wasn't working but that kind of dialogue is so good because you know you're sort of bringing, the chance of us using that piece of information in the future is small but it's the fact of saying well I'm going to build this building, its fancy and it's a lovely building I do like it and but the construction process had to think of something as basic as demolition and the building guy there telling you this and his problems informs us and how we should be designing things because although we might not be directly involved in demolition we are involved in construction and therefore if the person says well you know don't do this guy's please don't do it you'll make my life hell if you do that you know, so you take that knowledge and then you integrate that into your process and that's why you know it should be a more integrated, our education, just the industry full stop should be more integrated, I mean I don't know what use talking to other people in other sectors, I don't know what they'd say about architects but I bet some of it wouldn't be kind

M I haven't come across anything yet

E No, no just sometimes the problems that we sometimes set you, you know we want it to look like, we want them to do something and sometimes were not mindful of the problems we are creating in aspiring to that

M Ok. Has anyone got anything else that they'd like to add?

D don't think so

E No

C No

M I think I've covered everything

A I think so yeah

M That was great thank you lost of useful information

E Pleasure

## Appendix 13

	A	B	C	D
1	<p><b>Barriers</b></p> <p>You only ever do anything in work if you have to in terms of sustainability if it saves the company money or anyone money...budgets are so tight at the moment that they tend to only do what they have to...when the economics changes in terms of construction and they're judging people on quality instead of just on costs then it probably has a bigger effect and we can then try to go more for sustainable items because that then gives a better value to the project and the people who are selecting the projects will then get on that rather than just on long term</p> <p>yeah yeah unfortunately the way it is now people look at the money side obviously straightaway and sustainability will be pushed back in terms of order on importance</p> <p>We come in with a figures, 10, 20, 30% above where they believe (the client) the value is and they go no its too expensive we need it cheaper. And to get it on site and get the project going you need to bring the cost down and to bring the cost down you look at ways. And is like well ok well that material's cheaper, that material's cheaper, that material's cheaper not and you don't look at the sustainability of the material you just look at the cost of the material to bring that price down so that the client's happy at saying there you go there's the there's the there's the contract please go and build it for me</p> <p>yeah no I agree with you so there's always time cost, there's considerations and that for your clients at this moment in time they're much higher priority than environmental considerations</p> <p>you know that's the other, maybe the three stool thing you know its the same point on the score but the other thing could be the most, best cost effective method of it might be using brick that we have to mine from Cheshire somewhere that actually isn't the best for the world or oil from fracking or something like that that's not actually the best thing for the planet but its the most cost effective for someone who's running a building for 25 years</p>	<p><b>O : 1.10 Time</b></p> <p>that's very difficult to understand when you are trying to put together a building in a very short period of time and select materials over what it looks like and then try and source it. So its not an easy thing to do</p> <p>They're to be honest not really interested in all the bits about the construction and design, they just generally want it fast cos that's when their money, they've laid out all this money and they've got to start earning off it to put buildings up like this and fill them up. And so they just want it done fast and so the time that it takes to do all this is very difficult to build in to the normal building programmes</p> <p>My first job was eight of us working in an architectural office, working on a scheme that was for £1 million the Liverpool School of Architecture extension. And it took 18 months for a team of eight of us to hand draw everything. Do the bills of quantities, details and that then went out and I think it was then 4 months for the contractors to price that up. That job now would be expected to be done by one or two people in probably 16 weeks</p>	<p><b>T : 1.16 Client Demand</b></p> <p>But you see quite often buildings are done by developers who then sell them on and so there's a sale to them and who actually run the building afterwards. They sell them on to pension funds and things like that and slightly cheaper running costs help sell it as well. So they might, they might try and select something that's slightly cheaper because they want to give it a certain efficiency but if they actually owned it for the next 25 years it's more important</p> <p>especially a company in this sort of climate where there's no profit and everyone's struggling, they can't make any money, they have to make it now or bust really so</p> <p>you've got to remember that the client is looking for their end building. They're to be honest not really interested in bits about the construction and design, they just generally want it fast cos that's when their money and they've got to start earning off it to put buildings up like this and fill them up. And so the time that it takes to do all this is very difficult to build in to the normal building program</p> <p>it doesn't matter how green James is if the business, this business is run along the lines that meet the client and clients don't demand it they respond to what the client wants</p> <p>and if you give them more for the same price then they'll be quite happy to take it but most companies will try and be green as much as we can but if it starts to cost more money and that goes to the client they say well we're going down the road its cheaper down there. And that's the same with all of the transport building together</p>	
2	<p><b>1: FG 1</b></p> <p>The problem with sustainability is in order to make it a sustainable product there is a cost implication to it</p> <p>And the end client won't pay for it ... We try to bring it in I mean we use recycled products wherever possible, we try to minimise any impact that we are going to have on it but ultimately we can't achieve 100% sustainability until the client's want to pay for it and they're not</p> <p>we're in an industry driven by cost</p> <p>yeah so everything we do is just driven by cost, people don't really specify anything to do with you know</p> <p>Its only some of the very very specific clients where you can start to build it in and costs becomes less of a driving factor but in 99-98% of our contracts cost is key</p>	<p>its still a question of time. The whole of the project then you've got to remember were in an industry that's took a kicking over the last 6-8 years we as a company are now trying to do the same amount of work with a third of the staff, no ones got the time which as Kennedy was saying if something comes on sustainability, we'll pick the last person in the office whose still fresh faced and not having a massive input on the business but send him off to the course get him to make the notes, come back and he might do a 10 minute presentation in a monthly meeting and that will be it. People haven't got the time at the minute or the resources to send people off to do it, as we said before its got to be driven and they've got to be forced to do it to change it and until that happens its not going to happen</p>	<p>you've got to adjust client then I don't think they would ever select you over someone else because its like CLIENT though isn't it and how if you want to design anything for network rail and all the things like that through and how its got to be way over the top on design they don't like any innovation at all do they you've got somebody and its the same for like building regs or anything, even if you've got some because you can offer them something that's ??? or they want to do it and they want to be innovative because then there'll be something like that that likes blocks it and they say oh no you can't do that</p> <p>No no, its client driven, if your client is building and they just wanted to use British standards</p> <p>we're putting in a bid, in bids and the client does their own budget and our bids are between 10 and 15% of clients perception of well I believe its worth this when actually they don't really know what the value is</p> <p>There's no way you can try and convince a client to try and spend more money for a better quality product what he's actually after, after is some quality. They'll have cheap and nasty and very unsustainable products</p>	
4	<p><b>2: FG 2</b></p> <p>At the end of the day they look at the bottom of the quote, if its cheaper than another contractor then we win</p> <p>If at the end of the day the client says no I want 100 units instead of 60 as you've shown with a lovely park in the middle and a pond or something then it can't always be done and we have to rely on the planners to step in at that stage because you know it gets to a certain point where clients have certain profits they have to make on sites and the practicalities of the development and the risk that a, you know its not always possible to get everything we want in</p> <p>a lot of that eventually comes down to cost but a lot of it can be done at the same cost as you know the ideas that we would have is to integrate development site within the community it may have no cost and that's where we need to be able to say to the client this is, this is really where you should be going, for this reason</p> <p>often they're receptive to that and its getting past that initial stage of sustainability being a cost because its seen as add-ons, more add-ons and that comes from renewable energy really as much as anything which you can separate from sustainability in</p>	<p>on paper its supposed to be part of the studio module and when you're designing your buildings but I don't know whether it is time constraints or because the tutors haven't got as much input as they would like to cost obviously from my point of view we don't, we only know what we've learnt in the lectures and its the tutors who have the opportunity to guide us with it but because there's so many other things going on it does kind of get pushed to the side but I do think the further you go on with the course like in the masters its, it does become more of a focus</p>	<p>some agendas a client might not wish to engage with and they are limited</p> <p>Commercially as Simon says I think you do, you have limited options because your client is the person commissioning you</p> <p>think you need to engage with your client's pre projects in many ways and many of the clients we work with are already in place and those agendas are driven by.</p> <p>its not our decision I think at the end of the day is the key thing but we are in the position where we have to think about things and we are listened to you know, I'm not playing it down but there are other issues</p>	

## Appendix 14

From: Paul Murray [P.Murray@plymouth.ac.uk]  
>> Sent: 13 September 2013 09:51  
>> To: Brennan, Michelle  
>> Subject: RE: The Sustainable Self

Of course Michelle; let me know how it all goes, and if you'd like a phone chat before running anything, do let me know.

Paul

-----Original Message-----

From: Brennan, Michelle [<mailto:M.Brennan@ljmu.ac.uk>]  
Sent: 12 September 2013 22:25  
To: Paul Murray  
Subject: RE: The Sustainable Self

Hi Paul,

Further to my previous email, I'm just checking that it is ok to adapt your interventions in the pack? I have used your values circle and done a list of definitions with some of my own included.

Kind regards,

Michelle

# Sustainable Development for Construction and Property Students

## Introductory Workshop





Name.....

Age .....

Gender.....

Student ID.....

Course of Study.....

Year.....

### **Aims of the Workshop**

- To develop understanding of Sustainable Development
- Connect with the sustainability agenda through discussion and activities
- Explore how our values, beliefs and attitudes impact on how we act in relation to sustainability

### **Outcomes**

- A deeper understanding of sustainable development and the issues surrounding it
- An understanding of how we might become more empowered to act sustainably both in our personal and work lives through our values and beliefs
- How we might apply this in our working lives as built environment professionals

### **Task 1. Definitions of Sustainable Development**

Over 200 definitions for sustainable development exist which is part of the problem of getting industry to act sustainably. Below is a short list of some of the definitions. Please read each one and think about which one best reflects YOUR understanding of sustainable development. Think about the key words and actions that YOU feel reflect sustainable development. If none of the statements below suffice please feel free to develop your own.

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

***World Commission on Environment and Development - Brundtland 1987***

“Sustainable development means encouraging economic growth while protecting the environment and improving our quality of life - all without affecting the ability of future generations to do the same”

**UK Government**

“A dynamic process which enables all people to realise their potential and to improve their quality of life in ways that simultaneously protect and enhance the Earth’s life support systems”

**Forum for the Future**

An emphasis on social, economic and environmental wellbeing for people and communities, embodying our values of fairness and social justice. We must also look to the longer term in the decisions we make now, to the lives of our children’s children as well as current generations

**Welsh Government 2011**

Sustainable development refers to the fulfilment of human needs through simultaneous socio-economic and technological progress and conservation of the earth's natural systems.

**A.P Sage 1998**

Sustainable development is all about ensuring a better quality of life for everyone, now and for generation to come, through: social progress which recognises the needs of everyone; effective protection of the environment; prudent use of natural resources; and maintenance of high and stable levels of economic growth and employment.

**DETR 2000,**

**Task 2 – Pictures**

**In groups of 4 or 5 spread out the photographs and have a good look at them.**

**As a group think about what the picture is conveying and rank on a scale of 1-10 how the photograph makes you think about sustainability. As a group discuss why the photograph makes you think about sustainability and write down your reasons.**

Photograph 1: Rank \_\_\_\_\_

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Photograph 2: Rank \_\_\_\_\_

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Photograph 3: Rank \_\_\_\_\_

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Photograph 4: Rank \_\_\_\_\_

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Photograph 7: Rank \_\_\_\_\_

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Photograph 8: Rank \_\_\_\_\_

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Photograph 9: Rank \_\_\_\_\_

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Photograph 10: Rank \_\_\_\_\_

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### **Task 3 – Circles of Empowerment**

The aim of the next task is to get you to think about how you can make a difference.

Many of us believe that we are powerless to act in some situations and often uses phrases such as “There is nothing I can do” and “I can’t”. These are limiting beliefs in that they can limit us in what we are actually able to achieve. Even the smallest changes can make a huge difference and influence others in the process known as the ‘ripple effect’. Whilst we may not be able to stop climate change as individuals, each individual as a collective can significantly help to reduce it.

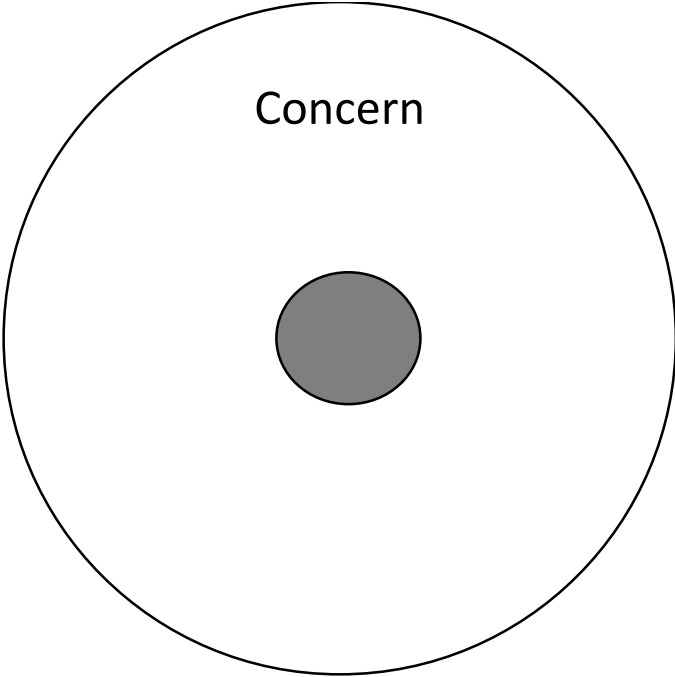
Self-limiting beliefs cause us to be reactive rather than proactive people. Reactive means we only respond to situations when we are forced to whereas proactive means acting in advance to deal with expected situations and difficulties such as taking proactive steps to reduce climate change.

This activity should help you think about personal empowerment and what you ‘can do’ to achieve positive outcomes.

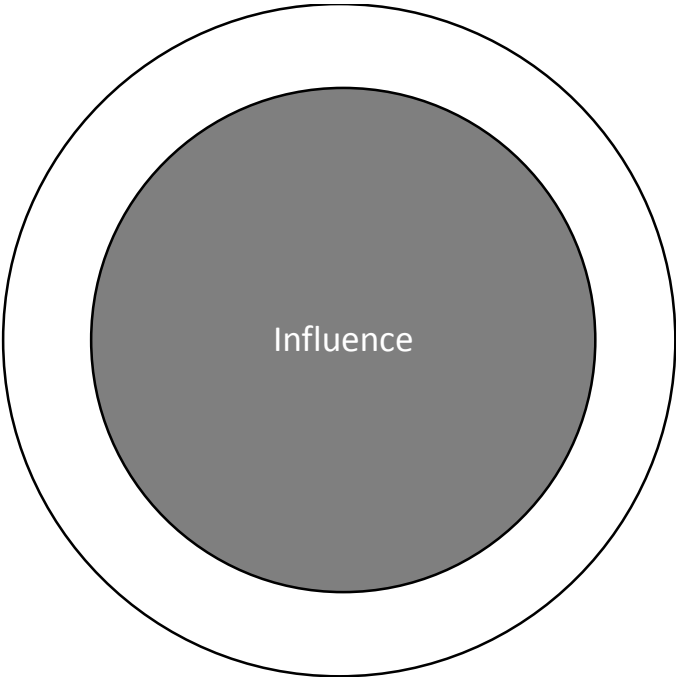
Below are some circles of concern. In your groups discuss what you ‘can’ and ‘can’t’ do about poverty and pollution.

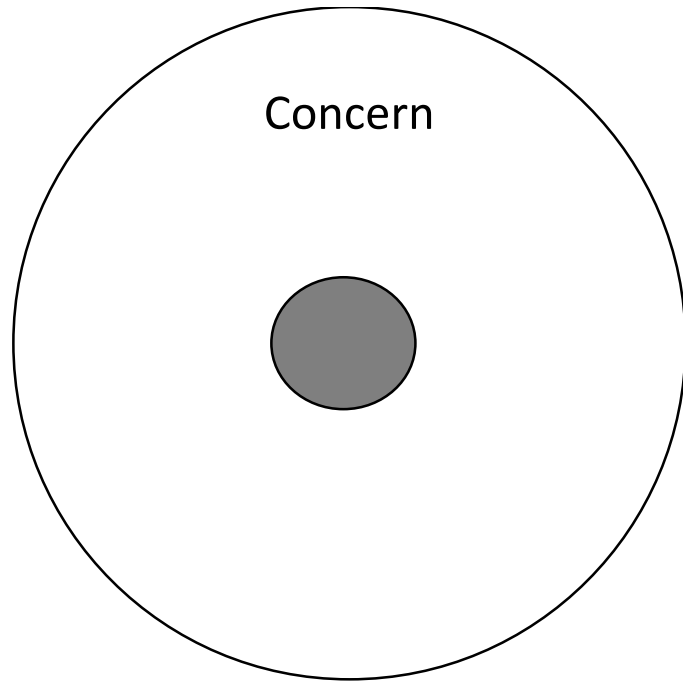
In the first circle imagine that your concern about the issue is large but that your influence is small. So you are really concerned about poverty but believe that that there is not much you can do to help alleviate it. Think about the things you ‘can’t’ do and place them in this circle.

In the second circle your concern is less but you believe that your influence is large. So you are not really concerned about pollution but believe that that there is a lot you can do to help reduce it. Think about the things you ‘can’ do and place them in this circle.

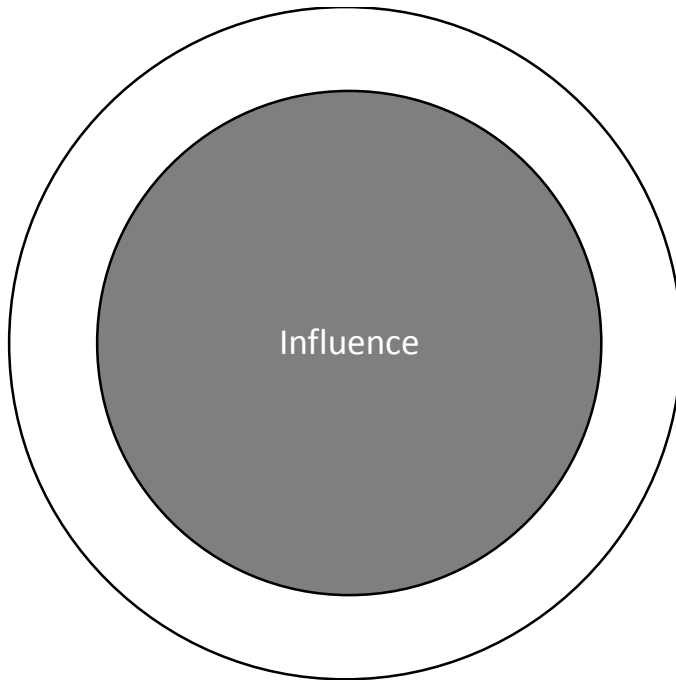


**POVERTY**





**POLLUTION**





## Task 4 – Values

A value is something that is intrinsically important to us in life. They are our ideals and motivators that determine the way we want to live and the way we carry out our lives. In some cases however we experience conflict between what we value and how we act.

Some values are more important to us than others and so they are hierarchical. Having completed the above tasks, think about your values. In the circle below starting from the centre working your way outwards, write down what you care about most.

Below is a table of some values you might want to consider:

Achievement	Fidelity	Love
Adventure	Financial security	Loyalty
Ambition	Fitness	Nature/earth
Authenticity	Forgiveness	Patience
Acceptance	Freedom Friendship	Peace
Appreciation	Friendship	Personal Growth
Balance	Fun Grace	Preservation
Beauty	Generosity	Privacy
Bravery	Good will	Purity
Caring/Considerate	Grace	Purpose (in life)
Charity	Gratitude	Recognition
Commitment	Health	Religion
Community	Honesty	Reliability
Compassion	Honour	Respect
Confidence	Humility	Responsibility
Creativity	Independence	Self esteem
Diligence	Influence	Spirituality
Emotional well being	Kindness	Stability
Empathy	Knowledge	Trust
Equality	Job/career	Understanding Tolerance
Family	Justice/Fairness	Wealth







.....  
.....  
Please take the attached questionnaires home with you and complete in your own time (15 minutes maximum) and return them to your module tutors at your next session.

Thank you and hope you enjoyed the workshop!

If you have any questions or queries regarding the workshop or in general regarding any of the topics or tasks covered please contact [M.Brennan@ljmu.ac.uk](mailto:M.Brennan@ljmu.ac.uk)

## **Appendix 16**

Dear All

Michelle, my PhD student, is doing research into student attitudes to sustainability. She would like to do some sessions with our level 5 and 6 students. These would take the form of workshops and she would need to do 2 x 2 hr sessions, 1 in semester 1 and 1 in semester 2. The class would need to be in a classroom rather than a lecture theatre.

She will hand out the questionnaires then do some cognitive maps, do a picture session and try and relate it to aspects of the questionnaire and she needs to decide on a couple more tasks.

I would be grateful if any of you would allow her to do this in your module(s) it would only be for 2 sessions and ideally the modules that would be best are those that have some aspects of sustainability in them, but this is not essential. Please let me know if you would be willing for her to do this and can build it into your teaching plan.

If you are willing, dates, times and module numbers would be great

Thanks Alison

## Appendix 17

### Paired Samples T-Tests

**Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	SDAM Total	106.79	58	7.120	.935
	SDAM Total POST	108.72	58	7.013	.921
Pair 2	Environmental Subscale Total	25.45	58	2.854	.375
	Environmental Subscale Total POST	26.48	58	2.742	.360
Pair 3	Social Subscale Total	28.90	58	3.048	.400
	Social Subscale Total POST	29.81	58	3.137	.412
Pair 4	Economic Subscale Total	26.03	58	2.740	.360
	Economic Subscale Total POST	25.71	58	2.804	.368
Pair 5	Other Items Total	26.41	58	2.086	.274
	Other Items Total POST	26.72	58	2.246	.295

**Paired Samples Correlations**

		N	Correlation	Sig.
Pair 1	SDAM Total & SDAM Total POST	58	.681	.000
Pair 2	Environmental Subscale Total & Environmental Subscale Total POST	58	.683	.000
Pair 3	Social Subscale Total & Social Subscale Total POST	58	.655	.000
Pair 4	Economic Subscale Total & Economic Subscale Total POST	58	.533	.000
Pair 5	Other Items Total & Other Items Total POST	58	.201	.131

## Independent Samples T-Tests Values Task

### Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1	SDAM Total - SDAM Total POST	-1.931	5.644	.741	-3.415	-.447	-2.606	57	.012
Pair 2	Environmental Subscale Total - Environmental Subscale Total POST	1.034	2.232	.293	-1.621	-.448	3.530	57	.001
Pair 3	Social Subscale Total - Social Subscale Total POST	-.914	2.570	.337	-1.590	-.238	2.708	57	.009
Pair 4	Economic Subscale Total - Economic Subscale Total POST	.328	2.678	.352	-.377	1.032	.932	57	.355
Pair 5	Other Items Total - Other Items Total POST	-.310	2.742	.360	-1.031	.411	-.862	57	.392

### Group Statistics

	Bravery	N	Mean	Std. Deviation	Std. Error Mean
SDAM Total	No	44	107.41	7.419	1.118
	yes	14	104.86	5.908	1.579
SDAM Total POST	No	44	109.61	7.428	1.120
	yes	14	105.93	4.698	1.256

### Independent Samples Test

Levene's Test for Equality of Variances	t-test for Equality of Means
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		F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
									SDAM Total	Equal variances assumed
	Equal variances not assumed			1.319	27.245	.198	2.552	1.935	-1.416	6.520
SDAM Total POST	Equal variances assumed	6.352	.015	1.743	56	.087	3.685	2.115	-.551	7.921
	Equal variances not assumed			2.190	35.176	.035	3.685	1.682	.270	7.100

#### Group Statistics

	Fidelity	N	Mean	Std. Deviation	Std. Error Mean
SDAM Total	No	51	107.43	7.089	.993
	yes	7	102.14	5.843	2.209
SDAM Total POST	No	51	109.29	7.027	.984
	yes	7	104.57	5.740	2.170

#### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
SDAM Total	Equal variances assumed	.950	.334	1.884	56	.065	5.289	2.808	-.336	10.913

	Equal variances not assumed			2.184	8.627	.058	5.289	2.421	-.225	10.802
SDAM Total POST	Equal variances assumed	1.461	.232	1.698	56	.095	4.723	2.781	-.849	10.294
	Equal variances not assumed			1.982	8.677	.080	4.723	2.382	-.697	10.143

#### Group Statistics

	Fitness	N	Mean	Std. Deviation	Std. Error Mean
SDAM Total	No	40	108.03	6.742	1.066
	yes	18	104.06	7.360	1.735
SDAM Total POST	No	40	109.80	7.311	1.156
	yes	18	106.33	5.790	1.365

#### Independent Samples Test

	Levene's Test for Equality of Variances	t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
SDAM Total	Equal variances assumed	.756	.388	2.016	56	.049	3.969	1.969	.026	7.913

	Equal variances not assumed			1.949	30.376	.061	3.969	2.036	-.187	8.126
SDAM Total POST	Equal variances assumed	1.723	.195	1.774	56	.081	3.467	1.954	-.448	7.381
	Equal variances not assumed			1.938	40.951	.060	3.467	1.789	-.146	7.079

#### Group Statistics

	Hapiness	N	Mean	Std. Deviation	Std. Error Mean
SDAM Total	No	56	106.98	7.174	.959
	yes	2	101.50	.707	.500
SDAM Total POST	No	56	109.07	6.875	.919
	yes	2	99.00	2.828	2.000

#### Independent Samples Test

	Levene's Test for Equality of Variances	t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
SDAM Total	Equal variances assumed	3.942	.052	1.071	56	.289	5.482	5.117	-4.768	15.733
	Equal variances not assumed			5.070	17.556	.000	5.482	1.081	3.206	7.758
SDAM Total POST	Equal variances assumed	2.145	.149	2.051	56	.045	10.071	4.911	.234	19.909

Equal variances not assumed			4.576	1.465	.077	10.071	2.201	-3.618	23.761
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**Group Statistics**

	Recognition	N	Mean	Std. Deviation	Std. Error Mean
SDAM Total	No	48	107.79	6.807	.983
	Yes	10	102.00	6.944	2.196
SDAM Total POST	No	48	109.60	6.937	1.001
	Yes	10	104.50	6.023	1.905

**Independent Samples Test**

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2- tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
SDAM Total	Equal variances assumed	.059	.809	2.440	56	.018	5.792	2.374	1.036	10.547
	Equal variances not assumed			2.407	12.865	.032	5.792	2.406	.589	10.994
SDAM Total POST	Equal variances assumed	.514	.476	2.160	56	.035	5.104	2.363	.370	9.838
	Equal variances not assumed			2.372	14.450	.032	5.104	2.152	.502	9.706

**Group Statistics**

	Wealth	N	Mean	Std. Deviation	Std. Error Mean
SDAM Total	No	37	107.78	6.511	1.070

	yes	21	105.05	7.947	1.734
SDAM Total POST	No	37	109.95	7.012	1.153
	yes	21	106.57	6.638	1.448

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
SDAM Total	Equal variances assumed	2.566	.115	1.419	56	.161	2.736	1.928	-1.126	6.599
	Equal variances not assumed			1.343	35.299	.188	2.736	2.038	-1.400	6.872
SDAM Total POST	Equal variances assumed	.497	.484	1.795	56	.078	3.375	1.880	-.391	7.140
	Equal variances not assumed			1.823	43.633	.075	3.375	1.851	-.357	7.106

## Appendix 18

C	D	E	F	H
<p>Portrays unfair living conditions and therefore is unsustainable from a people point of view as they are not experiencing a sustainable way of living</p>	<p>Similarly this is unsustainable as it shows how people globally are unfairly treated. Not have the option of an infinite tap at home</p>	<p>Unsustainable way of fishing or polluted water contributing to death of fish. Proves that our actions aren't sustainable and nature is being jeopardized for our benefit</p>	<p>Similar to H poisonous gases escaping into burning fuels. Not sustainable as destroys the ozone layer</p>	<p>Burning fossil fuels. Contributing to GHG and the earth's atmosphere damaging the ozone layer</p>
<p>It seems to be a population living slums. Therefore inequality is occurring. Most likely to be a limited supply of drinking water, food, cleanliness. Basically poverty.</p>	<p>This picture is showing a woman most likely having to walk a distance for water I heat showing a lack of equality</p>	<p>A lot of dead fish therefore must be a lot of pollution in the water. Most probably caused through waste disposal from power plants and facilities</p>	<p>There is a lot of smoke in this picture. I think it seems to be coming from a fire. This would cause pollution in the air eventually causing harm to the environment</p>	<p>This makes me think about environment being unsustainable. It looks like there is a lot of pollution being caused by power plants. Its seems like a lot of energy is being used which is affecting the climate</p>
<p>This could either show a natural disaster such as a mud slide or storm or it could show a poverty stricken country</p>	<p>Water looks quite polluted and area is very dry due to possible drought. Woman has probably travelled very far to get water</p>	<p>All of the fish have dies from possible pollution. These fish would not be suitable to be eaten causing famine and also put people out of business causing poverty. Water is very damaging when polluted which is why waste water must be treated properly</p>	<p>This picture shows visible pollution from effects of possibly burning fossil fuels. This pollution is a major factor of global warming which is a huge issue. Can also cause issues to people's health to animals and plants</p>	<p>Although H is very similar to F it doesn't give the same effect as from a distance it doesn't look as bad. This is still bad as this type of pollution would cause global warming</p>
<p>Natural disaster caused by flooding which could be as a result of global warming</p>	<p>Possible drought due to global warming</p>	<p>You can see how pollution can affect people's livelihood and wildlife around the polluted area this will affect the food chain</p>	<p>You can see visible pollution, can cause harm t people's health</p>	<p>Same sort of scenarios as picture F. But the effects aren't as visible to humans. Although you can see the scale of the operations and where it is going</p>

Doesn't look related to sustainability – my guess would be a natural disaster	Looks like a drought has occurred. Crops all dry and travelling to fill up water from well	Look at the wildlife harmed by pollution which will have a knock on effect to humans eating the fish	You can visibly see pollution from the source and people living in that environment. Can cause harm to both humans and the environment	Same as picture F but the photo doesn't show humans in the photo so it has a different affect although still bad
Refugee camp millions of people with no home. Has massive social issues	Drought so water has to be saved from wells. Might be dirty causing sickness	Water pollution effecting stocks which affects the economy	Factory burning fossil fuels creating fog air pollution	Large scale air pollution creating massive amounts of CO2
Refugee camp, this could be due to war, political or religious issues. This is a social factor but not always related to sustainability	This picture relates to 3 <sup>rd</sup> world poverty and this unfortunately has been happening for many years – women having to source water	Climate change causing sea levels to rise due to ice melting. Environmental issues which is an element of sustainability or pollution in the water, a cause of industry	Pollution, I personally think of carbon and carbon footprint	Could be a tornado or could be pollution. Not an impact to me
Represents poverty which is as a result of maybe the current industry in that country	Woman carrying water well. This has got to be related to 3 <sup>rd</sup> world conditions	Fish flooding the water could represent a number of factors. Could mean that the water has been polluted although this could help the local community in sourcing food	To me this photo seems the most important, it shows businesses are still polluting the earth with no due care	this photo has a negative impact on me due to the large amounts of smoke entering the ozone layer

I	J	K	M	N
Unsustainable in terms of people being subject to living in these unhygienic conditions and perhaps having to hunt for food	Shows unsustainable economy in terms of people and society and how it is being developed in terms of jobs and well being	Could be referred to as sustainable water is being conserved for use therefore not being wasted. However also unsustainable as not fairly treated as people are able to have infinite	Image shows poor living/ground conditions not a healthy or sustainable way of living	Shows polluted river/water. Refers to plant pillar and unsustainable use of natural resources

		amounts elsewhere		
This shows a dead animal showing me that there is no food or water around. Probably caused by globally warming	This shows that there is poverty occurring which is being caused by the current economy. It also shows northern rock which is a bank that has recent had mass problems	This picture caught my eye because it was a tap with a padlock on. To me this shows that water has become sparse indicating that natural resources are low		
I think this picture shows an animal that has died possibly from a lack of water or vegetation which again could be caused by a rise in temperature. This will also affect people who use the animals for food.	This shows a regular sight in this country. This could be due to not enough jobs or houses, however in my opinion there is no excuse for ant to not work or live in a home.	Tap has been padlocked possibly due to a drought caused by rise in temperature from global warming. Need to use sustainable energy rather than burning fossil fuels	Crops have been destroyed by flooding possibly caused by global warming. This not only affects us as we get crops from other countries but many people may depend on these crops just to stay alive	Showing a water source that is massively polluted. This causes damage to ecology. Animals that not only live in the water but also drink from the water. The water is being pumped out onto the ground which is very damaging. Can also destroy peoples lively hoods as shown in the next photo
Could be as a result of no water and animals are dying therefore having an effect on the food chain	Common sight in most UK cities	The same principal as picture M. the water has been stopped possibly due to a drought therefore affecting people's ability to grow crops and live	Has global warming caused this land to flood. Therefore no way to make money as he has no job	The water isn't very clean and it is being cleaned out and could cause harm to wild life and peoples livelihood
This land is bare and dry, the only food in front of them has been taken to pieces	Quite a common sight in most UK towns and cities	Water being essential in life, a lock on tap is uncomfortable	Floods have caused problems with the economy e.g. crops now flooded, no food or money	You can see some sort of pollution from the colour of the water. This will affect the water and all surrounding life
Cattle could have been killed by another animal for food	Banks collapse down to economic downturn	Drought, no way for crops to grow for food or exports	Poor farm land so no crops for the future	Waste from factories running into the water course. Has



				massive impacts on the environment
Carcass in the dessert - not necessarily related to sustainability. In my opinion this has always happened and could be a natural death	Economic crisis. Makes me think of 2007 when the financial crisis and related to sustainability as profit is an element	When thinking about this picture, could be considered as using less water	A hot country that has probably had a monsoon. Climate change but don't really think about sustainability	Pollution which is linked to environment. One of the elements of sustainability
The animal could have died through lack of water which in turn could have been the result of drought or it could have been natural death	Homeless man, maybe economic issues here	This picture represents the fact that water is available but at set times, maybe rations which represents maybe a drought in the area which comes down to the environment	Maybe a flood here which is usually related to the environment	This photo shows a local sewage plant which a pump in use extracting the water. The water looks polluted which in turn has a negative effect on the environment

## Appendix 19

### Poverty

Concern is large but influence is small (students believe they cannot have any influence in solving these problems)	Concern is small but influence is large (students believe they can have some influence in solving these problems)
Stop poverty	Donate to charity/food/clothes/money
Stop global warming	Provide assistance
Cure disease	Provide wells for clean water
Provide water	Educate
Provide homes	Use natural water
Provide food	Buy fair trade
Stop use of fossil fuels	Stop using fossil fuel
Stop deforestation	Stop polluting water
Create/provide jobs	Stop burning fossil fuels
Ensure everyone is treated equally	Don't waste water
Give everyone money	Engage in local help schemes
Develop a poor countries way of living	Buy from poor countries
	Spread awareness
Donate sustainably	Provide resources
Provide resources sustainably	Deliver aid
Redistribute wealth and natural resources	Give them chlorine tablets
Ensure producers get paid fair wage	Reduce impact on climate change
International trade	Reduce energy use
Change taxation	Write to the government
Change morals of big businesses	Convince governments to help
Get people to work	Convince private sector to help
Provide housing	Provide infrastructure
Help much about natural disasters	Charity work
Change cultural perceptions	Lobby MPs
Fix all problems straight away	University set up trips to less economically developed countries and get grants to help community. E.G Civil engineers to build infrastructure – helps communities and students in getting work experience

Convince governments to help	Reduce but not eliminate poverty
Political pressure	Create safe ground to grow food
Change government spending	Volunteer
Influence markets	Share knowledge
Prevent corruption	Buy from poor countries
Provide sustainable infrastructure	Funding education into how society can tackle poverty
Provide medicine for everyone	Provide aid
Control debt	Provide solutions
Cant ensure donations get to those who need it	Provide healthcare
Can't decide what prices are fair trade	Provide food
Feed everyone	Educate
War	Charitable donations food/clothes/money
Costs too much to eradicate poverty	Children in need
Help with erosion due to sun rays	Comic relief
Governments influence on other countries	Help the homeless – free food
Redistribute wealth	Recycle
Industrialise	Charity work
We don't make a difference	Personal sustainability
Make other countries governments care	Food banks
It's out of our control	Volunteer for refurbishment
Guarantee gift aid goes to right place	Develop living areas
It's too profitable for western governments	Had the capability to end poverty for years
Problem increasing in scale	Use money from cigarettes and alcohol to provide solutions for countries to bring themselves out of poverty
Stop world hunger	Build schools and hospitals
Help everyone	Give a man a fish scenario
Stop people getting selfish	Build low cost housing
Happens even in developed countries	Donate
Equal distribution of wealth	Create jobs
Prevent death due to lack of healthcare	Distribute food equally
Force people to change their lifestyle	Provide jobs
Free the world of war	Stop deforestation

Pay global debt	Feed the homeless/ Build homeless centres
Eradicate third world poverty	Employ the homeless
Change the political landscape	Donate to food banks
Feed the world	Set up safe towns
Stop greed	Charity events
Have a major impact	Spread the word
Give them clean water everyday	Support charities
Change attitudes	Spend 2 weeks abroad helping
	Raise money
	Recycle
	Supply water mains
	Social redevelopment
	Waste disposal systems
	Reduce contamination
	Basic food packages
	Create health centres

## **Pollution**

<b>Concern is large but influence is small (students believe they CANNOT have any influence in solving these problems)</b>	<b>Concern is small but influence is large (students believe they CAN have some influence in solving these problems)</b>
Stop Carbon footprint	Walk
Stop Climate change	Save energy/reduce consumption
Stop icebergs melting and sea levels rising	Cycle
Deforestation	Monitor and reduce carbon footprint
Use of fossil fuels	Recycle
Stop LEDCs from polluting environment	Find renewable energies
Change legislation in other countries	Use car less
Poor waste management	Turn appliances off/ Be more energy efficient
Sourcing of materials	Public transport
Nuclear	Use sustainable methods of construction
Make other countries care	Use sustainable/recycled materials

Stop large industries from burning fossil fuels	Education/awareness
Stop china	Local labour
Behavioural change	Grey water harvesting
Control personal resource use	Better waste management
Green taxes	Raise awareness of damage being caused
Lack of global commitment and cooperation	
Control big business in other countries	invest in personal sustainable energy resources for homes
Building of industrial power plants	Funding more studies into more viable energy sources and how they can be applied nationally
Influence other countries to go green	Encourage stronger legislation and enforcement of policies for organisations
Offer alternative energy systems	Better health care
Control companies/energy companies	The future of the industry
Replace old factories to modern eco factories	Wind power
War	Hydro power
Cant reverse effects	Contribute to technological advances
Stop production	Don't litter
Cant increase natural resources	Use Less water
Can't get rid of all pollution	Eat less meat
Can't have 100% renewable resources	Fly less
Stop growing dependence on power	Power – use green tariffs
Shut down factories	Increase renewable energy
Use of coal power stations	Reduce resource usage
Land fill	Go vegan
Waste/oil into the sea	Greater legislation/regulation to tighten up on pollution at domestic and industrial level
Change taxes	Global treaties to reduce pollution
	Avoid purchasing from 'known' companies which continue unsustainable practice
	Source products locally
	Re use plastic bags
	Repair old items
	Use alternative methods to reduce carbon footprint
	Use energy saving devices

	Sustainable technologies
	Passivehaus
	Legislation
	Conserve power
	Sustainable attitude
	Use green energy tariff
	Driver lower emission cars
	Reduce fuel consumption
	Don't have gas or heating on
	Switch off lights
	Save water
	Implement waste saving in work
	Lower co2 emissions
	Nuclear power stations
	Installation of solar panels on new buildings

## Appendix 20

	N	Mean	Std. Deviation
Adventure	17	2.82	1.468
Ambition	27	2.15	1.134
Acceptance	13	4.08	.862
Appreciation	18	3.72	.895
Balance	11	3.64	1.120
Charity	10	3.30	1.337
Commitment	15	2.93	1.335
Community	12	3.25	1.422
Equality	19	2.84	1.068
Financial Security	24	2.04	1.083
Friendship	36	2.36	1.046
Gratitude	10	4.20	.789
Health	43	1.77	1.109
Honesty	26	2.50	.906
Humility	9	3.22	1.093
Knowledge	24	2.54	1.351
Justice/Fairness	13	3.15	1.281
Love	27	2.26	1.228
Loyalty	22	3.23	1.152
Nature/Earth	12	2.00	1.279
Personal Growth	21	3.24	1.446
Preservation	8	3.38	1.408
Purity	6	4.17	.753
Religion	11	3.55	1.864
Reliability	9	2.78	1.202
Self Esteem	10	3.00	1.414
Spirituality	7	3.57	1.397
Trust	26	2.35	1.018

## Appendix 21

- MB So how you think this would this translate into industry, would the tasks work, are they too low level, do they need something more?
- AA So the purpose of this tool is to teach SD
- MB It's not about implementing SD into their projects etc., it's about the why not the how, it's not about how do we build a sustainable building it's about why should we be building sustainable buildings
- KH And whose it designed for?
- MB I designed this for use with students because industry told me it's going to have to come from education
- TW So this is an output from your research, industry told you actually we need to be influencing people before they get into industry
- MB Yes but obviously there are a lot of people in industry right now who make the decisions and it will be a while before the students we are educating are in those positions
- AA Right so used at different levels then, can this be used at the educational level and also is it transferable to industry
- MB Yes
- AA Well you're dealing with different people, I think you've got more malleable minds in education because people are more open to ideas that would be probably slightly more tuned into issues of SD whereas if you're talking about older people who've been in the industry for a while they'll probably be more cynical about these things, yeah you're going to come up against different challenges aren't you
- MB Yes completely which is which I am seeking your advice as to whether you believe this would be useful with industry professionals, so the picture task for example that was a really good task the students really engaged and enjoyed that. Do you think that is something industry professionals would engage with?
- AA I'd be wondering about the choice of images and why, I'd be wanting to know why, there is clearly some reason behind them obviously that's socio economical
- MB Well that relates to poverty and everyone ranked poverty as the lowest as though it's not important
- AA Is that because of what people understand sustainability to be?



- MB Yes they don't understand it as a holistic approach, they still very much focus on the environmental. So this was to challenge those perceptions and they were given the debrief after
- AA It's just good to understand where all this derives from to put it into context, so would that work with industry? Just looking at the next task I'm not really understanding this task can you explain that to me?
- TW So those two circles related to poverty, something you think is a big concern but you've got little influence over, and something that is of a concern and you have big influence but you're not really concerned about it
- MB Yes, so they discussed that in groups and then wrote down their own individual answers
- TW Is there any reason why you just chose pollution and poverty for this task?
- MB Time limits and just to get start to get them to think about their influence as it leads onto task 5
- AA And what does that tell you about them?
- MB Well it was more again leading onto task 5 getting them to think about what they can do in their jobs that they can do as professionals with SD
- AA Right got you so this is more a theoretical that leads into the more practical?
- MB Yes, for the analysis I created lists of everything they wrote and did an explanation and synopsis of this
- AA Right ok and the next task
- MB This is the crux of the thesis really, what's important to us and why SD, our values link to our attitudes
- TW So it's just a task to ask to get people to say what they value
- MB Yes but they start to think about what's important to them in the process
- TW Does it matter which section or is it just more about the distance from middle outwards, the quadrants don't matter
- MB No just distance from middle outwards, but then their top four going in the middle you see
- KH You've asked a question whether it's had an impact on their thoughts and views, is that what it was designed to do?

- MB Yes
- KH So the idea is they come to this workshop and having worked through those activities it will alter their attitude towards SD?
- MB Yes its thinking about it is a different way that they perhaps haven't before
- AA I was going to say it's more about challenging their current belief to say is that right or is that, not necessarily the right one, does it reflect what SD actually is but I don't know whether, because I'm just thinking about the way in which you're trying to do that, the pictures for e.g. which seem to be for me the strongest influence in that, you know it's a very, we respond to visual cues, is that, are those the right pictures, I'm kind of drilling down to the detail and I look at them and I go really? Where have those come from, do they really capture all the aspects of SD
- MB So the pictures would need more of a background context? ]
- AA Yeah I think so because I think it's why have you chosen, I look at them and I think ok they've been chosen for a reason because if you're doing a scientific study like this you'd want to have something that's going to stimulate a particular response and I just don't understand why these, maybe I'm thinking about it in too much detail because it's my area
- KH How do you run the workshop? In terms of each activity what do you do? Do you introduce it or do they literally just work through the book? Do you give them any verbal instructions or do they literally just read the book and is there any information between the activities or do you just go from activity to activity?
- MB They're placed in groups of 4-6 depending on the class size and I ran through what the workshop would entail. They were told a timeframe for each task and that I would be stopping them in between in each task before moving on the next one. So they had 15 minutes for the first task which after this time I stopped them and made sure everyone had finished and then I moved them on to the next task and so on etc. As they were completing the tasks I went around the room speaking to the students and asking them what they thought challenging these thoughts but not giving them answers in order to provoke some different thinking
- TW So the question you're asking us today is would this work in industry to change attitudes, so the question is did it create any impact?
- MB Yes there was a positive change in attitude post intervention
- KH So you did a pre questionnaire and post questionnaire but you hadn't told them at any point that you were trying to change their attitudes
- MB No

- AA And from your research was there a shift?
- MB Yes
- AS And the question out of this is do we think this is appropriate to take from what you tested with students to industry professionals?
- MB Yes so for example the values task, getting them to think about what is important to them this values are something we never consciously think about so getting people to actually think well what is important to me
- TW Isn't the stuff what you've done just saying how they feel right now? You haven't introduced anything that moves them on
- AS To me this is the middle bit, you've got to present or get them to tell you what their understanding of SD is then take them on that journey through this,
- MB So maybe not give them the definitions but write their own what they believe SD to be?
- AA And this is when you first presented those ideas around the definitions and there are over 200 and you've given them 6 of the more popular ones some of which we'll be familiar with but they were all kind of variations on theme really, it's just the same thing said slightly different and I just wonder whether actually there's an opportunity to shake that up
- MB In what way
- AA In that in respect of, what did you get out of their answers to question one for example?
- MB They chose mostly the Government ones, Brundtland or DETR. None put their own
- TW I don't see anything in there that tends to move them on by the end of the workshop, it only gives their current thoughts and feelings as they feel right now based on their sets of values
- AA Which in a way is a good first step because if you want to influence people you want to know what their current belief set, current state of mind is
- TW So was the purpose of the workshop was to change the attitude a bit?
- MB No ongoing – but a limitation of the research is that I didn't go back and check
- AA In terms of the approach that you've taken because you've obviously got, essentially 5 tasks to change their attitudes, do you feel on the basis of the research that you've

done and the evidence that you gathered to put this together that that provides enough of a, are those enough steps to be able to change someone's attitudes

MB Having read the literature around attitude change and what works I believed for the context in which it was used yes, whether that would lead to long term change, but having now done it and looking back over everything although there was a shift in attitudes something more may be needed

AA Right ok that helps put it into context, so this is more of a starting point, almost establishing a baseline really and it has to be followed up by something a bit in-depth and a bit more rigorous and you then take, so say we were all the MD's of BIG companies and we say you need to do something about SD become greener as companies, you need to take people on a much more rigorous journey I think in order to change their attitudes because for me all that does is give you a snapshot of how their feeling, which is fine because you need to do that and if you're sitting with big influences you want to know where they are at the moment so you can start to, if you are going to change the way they view things you can start to poke at the things that you know are important to them

KH It's a bit like personality profiling I do

TW It's a bit like the do you believe in climate change presentation I do, we show that image which provokes thought at the start and everyone goes yeah, yeah I believe it but during that process we say ok if you went into a supermarket and the more sustainable product cost more would you choose it and everyone goes no, but they all put their hand up at the start because they see the image of London under water and all want to combat that but when it came to choosing orange juice off the shelf their not choosing the sustainable choice

MB So whether this then translates into sustainable behaviour

TW Yeah

AS So for me though the question you did at the front end, the responses you would get from industry would predominately be negative, so I would say that as a starting point, because there's people that don't understand, similar to BIM, similar to Lean what SD actually is, they think it's just the green bit

MB So you think that they need a brief introduction

AA Well I think that the interesting thing is to get their initial understanding because, and I think that's why I think you need more varied definitions, you've essentially got 6 of the same definition

- MB All the students have a sustainability module so they have a basic understanding, but with industry they would need a brief intro
- KH To show individual differences what you could do is you could take those 6 definitions and give them some other ones you could give the Brundtland and the DETR because those are two good ones and then give them some which say about SD is about stopping pollution, it's about producing less waste and then you can pick out how people view sustainability
- MB So use buzzwords?
- AA Yeah because people view SD in different ways, there are people who have a much more holistic view who will pick out the ones that take into consideration the economic environmental and the social and stuff and then there'll be others who do believe yeah it's about producing less waste, making sure we recycle our green bottles
- MB So need more of a variation in the answers?
- AS I think your statements would have to cover the economic and the moral etc. separately to see which they view SD more as
- TW choosing orange juice off the shelf, which one would you choose, ask them to say why. But then you'll find when you look at peoples values you'll probably be able to correlate some of those choices based on their values as well
- MB But they've just done the picture task which made them think about poverty and not having enough money and how environmental impacts impact this, and then they're thinking about values and what's important to them so they'll already hopefully have that going on in their mind. In a different situation of course their values choices might have been different
- AS In and industry facing workshop where you've got to take them on that journey
- KH Yeah you have to take them on that journey
- AS Economically morally which one are you drawn to and then you can build on what you've generated as your questionnaire, not give the answers but make sure that the understand SD isn't just about putting grey water harvesting into our buildings its bigger than that its more than that
- TW It's changing our values and changing some of our choices around them isn't it. Because that's the challenge we all face, we have to take a different, when were presented with situations the current behaviours don't make the right choice
- KH This is a bit like our personality profiles, you can do the profile but that's fine but it just sits on a shelf gathering dust and you don't do anything about it, what this does

is tell you what our personality profiles do, but the value in there is then how do you use that information to change the way in which we interact with each other, and you kind of jump from task 4 to 5, you've done the kind of who are we, challenged their beliefs and started to elicit what their beliefs are based on and some of their attitudes and then you've said that having done that how does that make you feel about what have you learned and I just wonder whether is that a bit of a step too far within this given that as we said you want to take them on a more detailed journey

TW That for me is, the students that you've put this to have been programmed already to start thinking in that mentality if that's what they're doing on their course, if you go out into industry I think you need to show people actually you might need to be reconsidering how your programmed and this is what it looks like and then you're doing this to gather the evidence back from them and as AA is indicating there I think giving them the influence for the journey ahead because I just think again similar to BIM there's so much misconception about what SD really is

MB So they need a 10-15 minute presentation on what SD is?

AS More to get them prompting their thought patterns, don't give them the answers to what it is, just say SD contains economic, social and environmental, fully flavoured by all, because if I'm talking about cores values and beliefs I'd align to one more than the other, yeah, it could be moral that is my core belief that's driving it forward but an MD of a company might be well actually its economic for me

AA It also kind of slightly catastrophizes things, it very much presents the world's problems to you, so you're kind of going oh this is bad, oh this bad to each picture

KH If it was being delivered in industry what purpose would it have, who would want it, why do you have to look at it in relation to industry, who wants it

MB Well industry don't want but we need to change people's attitudes regarding SD because nothing is being done, whether how it would be implemented either training course or CPD this is where the research comes in

KH So you couldn't do the, you're not telling them it's about changing attitudes before or during because people would have to choose to come on it wouldn't they in industry

MB Well I only measured that for my research so I have tangible outcomes but if it was to be delivered in industry then perhaps you wouldn't have to measure them

TW So let's say a post office came to me, Royal Mail, and said we want to change attitudes in our business would you start with a workshop like this,

AA No I'd start my understanding the business a little bit more and understanding the culture within, that's what, that's how we start it,

- MB But this is focused on construction specifically only though
- AS Prior research has been done I presume saying that culture and behaviour is a requirement for SD, it's a key theme that needs to be addressed in the industry that's why you're looking at this?
- MB Yeah
- AS So if I was going to do that workshop I would get people to tell me what they believe SD to be and then get them understand what SD is, tell them about it
- AA Well actually that's what, I think that's what this is trying to achieve but it's a case of, it's not saying what would you do it's a case of is this, does this approach work based on from an academic rigour, so Michelle's doing research , so we've got to club our practical, so if you were to look at it and you're coming from an industry background going this is how we would do it, this is more about does this approach have academic rigour because that's what your PhD will be judged on
- MB Yes but I want to know can this translate into industry but also if you feel that any additions are necessary or anything you just don't feel would work
- AS Would this workshop work in industry
- AA Yes so the question isn't how would 'you' would do it, the question is based on what this is trying to achieve could it be yes translated into an industry context
- MB Yes so if I set a group of architects down say do you think that they would think that these tasks are too simple, do you think its high level enough?
- AS In that format for me, you would get people going I don't understand what you're asking me to do with this
- AA I think your right I think you'd have to put it into context in terms of what you're trying to achieve. You wouldn't necessarily give them any information about SD in the first place because then that's too much trying to influence their, actually this is that first step in trying to understand their perceptions
- AS But haven't we done that with the pre questionnaire
- TW I just think its drawing out how I currently feel I don't know whether it's changing how I feel
- AA And actually this is then obviously the next step on the basis of what this elicits from your participants, you design something which will change depending on what their attitude and view is

- KH So you've done the research, you've got, behind each one of these activities you've done research and that's why you've chosen that activity so which of these activities did you choose because they would influence changes in attitudes
- MB All of them, they build on each other to begin to personalise SD, thinking about what's important to us and so why it's important to act sustainably to try and preserve those things,
- TW I like the profiling aspect, You mention that the slightly egotistical members of society had less positive attitudes, so if you ran this on a premier football team for instance you'd probably think don't care, they'd like the picture of the diamond, whereas if you ran it on our section of industry, your architects might be caring and sharing but it sets a baseline, because if you ran this with a contractor you'd have a profile of what's in that contractor because that contractor has got a load of egotistical people, then they're not going to be able to transform because they're going to be more interested in screwing the client and getting the money out of them
- MB So on the values you would do a more robust analysis
- TW Yes
- AS I think for me there's a little bit of an element that you'd have to spoon feed them at the start. I think you've got to open with the social, economic and environmental, I'm not saying give them social but just say actually guys SD is social, economic and environmental, not giving that detail but letting them think about well actually that picture I just aligned to that now, when you showed me that picture it brought it home to me so that will show me that there is a transition, because I've started to shape, so if I'm sat at the front end and I don't understand that there are the different elements of SD I can't change my behaviour on this journey because I'll just stick to where I am so I think you have to open with that
- AA Well that's almost what your trying to find out what they are
- MB Well that's what the pictures task set out to do, think about the interconnectedness of the issues, one of my findings was that the pictures relating to poverty they didn't link that that to SD at all
- AS Because the amount of times that you hear comments around sustainability, SD, that green rubbish
- AA Well that's the thing you don't want to influence them too much you want to try and understand whether do they think it's just that green rubbish because a lot of people probably will do, so if you tell them it's about the other elements too and then say now you tell me what you believe SD to be



- AS Yeah so you would still do the questionnaire to gauge responses and where they are at based on that, you get that back saying it's just that green rubbish you go and say well actually guys it's a lot more than that, we are going to go through a change workshop, and then we come out the other side and reflect against AS
- AA Is it worth us seeing the questionnaire because then we can see what you did and understand the outcomes
- MB There are four subscales, 7 on each aspect of SD and then 7 on Government and education issues so in filling that in they're already starting to think about what they think about these issues anyway
- AA So this is the questionnaire they completed pre and post, right on the basis of their outputs this gives you a measure of their attitudes towards SD. The interesting thing for a piece of follow up research would be ok if we think as a group the workshop that you put together is more of a fact finding exercise around attitudes and beliefs and actually if you want to change the way people perceive and behave there's an additional intervention to do the difference between how you've done it so far and how it could be done if there was an additional intervention
- MB Yeah if it needs that change
- AA Not necessarily saying it needs that change but as a piece of research it would be a nice comparison to do and as a company paying for training or CPD you'd want to know if it's the most effective way so measuring is a good idea
- MB I know you say its only fact finding but the results of my research indicated that those tasks appear to have had some impact on their attitudes post intervention
- AA Oh absolutely I agree with you because the more I think about it actually I think those images have been chosen because they provoke a reaction
- MB They're not necessarily what you think they are
- TW How does this conclude with us now?
- MB I need to know whether this can be used in industry and if not what you would change about it, so task one I would need additional definitions that cover separately the elements of SD to gauge more robustly individual differences on their current perceptions of SD?
- AA I'd shake it up a little bit yeah
- TW The big question is, if we were asked by a client to help change attitudes across their organisation towards SD would we use it

- AA I think what you've got is that you've got an approach that's been developed an approach with a lot of stuff to back it up and tested in a scientific way which demonstrates that it has some impact, on the basis of what you've got could you potentially build on it. The questions isn't, don't get us wrong this is not meant to be critical at all its more about there is a basis for something to be developed
- MB So you feel that it's suitable but we think it needs building on
- KH I think yeah but not in its current form
- TW I think you could definitely use it, I like the format, it's a longer version of my do you believe in climate change question, what I would change is introduce something in the second half, if you were going to push this out to industry is something that actually tries to create the shift in terms of maybe using scenarios or other tools and techniques to challenge them in the process so that by the end of workshop they actually may go away and take some new behaviours away from the workshop, I don't think that it does that enough currently
- MB So time wise in developing a more elaborate model how much time would you allocate
- TW I would say half a day to a day with our clients and I would that there's definitely components of this that would work, I like the images in particular because I like pictures and makes me think about things
- AS It's a half day workshop definitely, so what you've got there is a baseline format of a workshop that can developed for industry with the backing of the academic approach its developed from and it's just taking into account what you would encounter in the industry, for me if you ran that workshop now, you might see one step increment change on the responses to the Q whereas what I would be aiming at is wanting to shift them up by either 2 or 3 increments heading towards scores of 5, you might get a small shift change with what you've got now with someone going you know what I never got that bit of SD so I've gone from a 2 to a 3 but I think there is more that could be added to shift them to a 4 or a 5
- TW I'd make it more, rather than getting people to write down their thoughts and feelings I would get them to do something like the run around activity which I use
- AA I was going to say actually the key for getting it right for industry is how you present it, it's how you put together a workshop
- KH Because a lot of the stuff you've done, I've probably delivered in a different way, but certainly the values and belief stuff I've done in leadership and management because understanding peoples personality to make changes to that personality means you have to understand what their values and beliefs are but you tend to do much more around explanation about what this and structured knowledge transfer as well

- MB Right ok so there needs to be a bit more knowledge transfer
- KH Maybe not before it but after, maybe do a debrief after the tasks, which I know you did but for us it's out of context and we don't know what came out of those discussions, and if there's so much value in that discussion afterwards how do they capture that value because you've got it recorded and you can write it up afterwards, what can they take away from those activities, I suppose that would be my question
- MB Task 6 offered them the opportunity to reflect on what they got from the exercise but for industry you think they need to go away with something more
- KH Something physical because ultimately if somebody sent a company representative on a workshop that's supposed to change attitudes for individuals they'd want them to be able to come back and share that knowledge
- AS That was going to be another question, when you talk about industry, is it individuals or organisations, from my perspective I would pitch that at organisation level and I would probably do spider gram based on what the outputs are from the first one and then a spider diagram after to show the stretch in the different aspect of SD because then that's a real tangible thing that the organisation gets from the process
- MB So did you think that the circles task was useful?
- AA I have to say of all the tasks that was the one I probably got the least but then that's maybe about whether they
- MB Well it fed into task five about starting to think about what they can and can't to and then thinking about that in terms of their professions
- AS I use that principle quite a lot around the circle of influence and concern, if it's a concern they need to understand how can I influence and control it so that's what you're trying to do through that process, I use that quite a lot because people say well I can't do lean because of, and I'll say well actually guys that is a concern, the bit you can influence and controls will then start to impact on the concern
- TW I like it I think it would work
- AS So maybe tailor that more not as wider issues but to issues within their organisation
- AS
- MB So almost blend it with that of task 5 but rather than ask them to write it down they use the circles to complete this task instead?
- AS Yeah

- AA I think it was more they were picked a bit at random but I understand what you're trying to do, elicit a response from them and get them to think about things
- AS So if you did poverty for example what are your concerns about poverty and then as an organisation how can you influence that. You could either pitch it as a workshop which individuals from organisations come to or if you're trying to change culture and behaviour for me it's normally organisational in construction at the moment not individuals because the individual would just disappear in an organisation that hasn't heard that message so I would want to pitch it at an organisation.
- KH I agree
- AS You could go in and assess with the questionnaire as we said before and provide feedback on the current state of their organisation and then say well actually you need to go on change programme and the intervention you did is the starting point of that
- TW I agree with you, I think ultimately that's what your trying to do, but its whether your approach is a bit like BIM champion we do, you take the individual as the change agent and you put them through this in order to be able to effect that change or do you design something that works at an organisation level, you'd still probably need that to get the right
- AA For an organisation what you have there is baseline
- MB So it's part of a wider programme
- AA Oh without question you can't do it in one session, but it's a good test bed, that's what you've got, you've tested the approach and it worked but in terms of practical implementation and what you need to do its organisation change which doesn't happen in a short intervention
- MB But there was some impact in that short time so it's worth pursuing
- AA Oh definitely