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Project...

Teaching Geographic Visualisation

Evaluating student understandings of visualising geographic knowledge.

Report to...

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Aims.

The project set out to “evaluate students’ understanding of visualisation techniques and the usefulness of different teaching approaches to help students understand the complex issues involved in visual representation.”

In summary, this report covers the first two of the following three aims:

- 1 – to evaluate students’ understanding of visualisation techniques
- 2 – to evaluate the usefulness of different teaching approaches
- 3 – to assess the construction of assessment criteria for the visualisation assignment

To achieve the objectives, Peanut were commissioned to evaluate “the delivery of a visualisation assignment on a second year undergraduate module about globalisation”, using participatory techniques and approaches.

Participatory research methods combine a collection of activities (or ‘tools’) and a set of principles (or ‘attitudes and behaviours’). They are used to involve people and encourage them to explore and communicate their perceptions, opinions, experience and knowledge. Participation alters the balance of power that usually exists between the research subject and researcher. Participants own and retain the expert knowledge about the topic, while the researcher’s expertise is in the participatory approaches and finding the best way for people to express themselves, not necessarily the subject being studied.

Participatory research is a qualitative approach. Participants are brought together in groups to explore a topic together and taken through a process involving different activities. The activities and process will often vary as participation lends itself to a range of different results. Analysis is through the drawing out of themes from conversations recorded as non-numerical, often text data. The ‘tools’ act to encourage conversation and as a visual record which can include photography, video, drawing, maps, matrices and diagrams. Notes taken by researchers provide additional depth.

Method.

Peanut prefer to work with an optimum group size of either sixteen or twenty, as four to five groups of four individual participants. As part of the project, we planned to involve around sixty students in the group work. The sixty students were split into three groups of around twenty. Each group was allocated a two hour session both as part of the benchmarking exercise at the early stages of the assignment, and the evaluation, towards its end.

The following plans ('Benchmarking' and 'Evaluation') are included as an outline of the method used to achieve the aims set out (See Aims) above.

Benchmarking Plan.

Photographs and notes will be taken throughout. Peanut will evaluate the activities following each of the three sessions. The following activities will be repeated at the end of the course to assess change.

Lines of preference.

Activity Outline.

Participants are asked to stand at either one or other ends of an imaginary line depending on their perception, preferences or opinion about a subject. Neutral space is at the middle of the line and can be either prefer 'both' or 'neither'. Questions to be considered by the participants...

- Working/Studying in... 'Groups' or 'Individually'
- Expressing yourself in... 'Pictures' or 'Words'
- Learning style... 'Listening' or 'Doing'

Following each...

- Do head count and note numbers.
- Ask participants why they've chosen to stand where they have, and note comments.
- Give them a final opportunity to change their minds (presumably having learnt something new from the comments from the previous stage).
- Ask those that have moved why.

Activity Rational and Outcomes.

- A bit of fun to put participants at their ease.

- Get a rough head-count of preferred learning styles and 'qualitative' commentary to support participant's positions.
- Forces participants to make a choice, helps to clearly visualise where participants (as a group of individuals) stand on an topic or subject.

Split into two groups.

Following the last 'preference' keep participants in their two groups (of preference), splitting people in the middle among the two groups for the next exercise.

Graffiti walls (words, individually)

Activity Outline.

Two graffiti walls (on two different walls), asking...

- 'What do you understand by the term... 'visualisation'
- 'What are your expectations of... the module/assignment (prompting to think about... what bits are you're looking forward to? Fears you might have? What you think the challenges might be? Will it be more easy or difficult than other modules or assignments?)

The two groups swap questions half way through the exercise, so that both groups answer both questions.

Activity Rational and Outcomes.

- To get a feel for participant's understanding of the term visualisation and what it entails.
- Also learn from participants about their perception about, and feelings for, the visualisation task.
- Observe how the participants work in a larger group, in comparison with the later tasks when they will work in smaller groups and individually.

Comparison Chart

Activity Outline.

To make an initial assessment of which teaching approaches and methods students feel (or perceive) both 'Help them to learn' and 'Which they prefer'.

- Individually think of all the teaching methods and approaches that they've experienced during their degree so far (no leading or explanations, interpretation is important).
- Write on post-it notes.
- Hand out 'Comparison Chart' sheets for the students to place the post-it notes where they feel they best fit.

Comparison Chart.

Preference	Dislike	Most/Dislike (3)	A Bit/Dislike (2)	Least/Dislike (1)
	Not Bothered	Most/Not Bothered (5)	A Bit/Not Bothered (4)	Least/Not Bothered (2)
	Like	Most/Like (6)	A Bit/Like (5)	Least/Like (3)
		Most	A Bit	Least
		Helps To Learn		

Scores will be summed to give a rough guide to which approaches are most 'preferred' and which 'help to learn' the most.

Activity Rational and Outcomes.

- To provide some subjective understanding about student views of teaching methods.
- To assess students appreciation of the range and type of methods used to teach and assess.

Spilt into three groups using 'Root Veg'.

Carousel

Activity Outline.

Three pieces of flip-chart asking three different questions...

- What information could we visualise ?
- Why would we visualise information?
- How could we visualise information?

Activity Rational and Outcomes.

- To get a more in depth assessment of participants understanding of the topic.
- To allow the participants a chance to discuss their thoughts.
- Observe how the three groups work in a larger sized group when compared to individual working.

Split into groups of five.

H-Form.

In smaller groups consider...

- 'positive'
- 'negative'
- 'changes/improvements'

... to the way we are taught.

- Demonstrate the use of a H-Form.
- In groups of five, use the activity to think through the three questions.

Activity Rational and Outcomes.

- To add detail to the 'Comparison Chart' activity.
- Get an understanding as to how participants think they would prefer to be taught, such as those things that might be more visual in style.
- To observe how participants work in smaller groups.

Tick List.

Activity Outline.

Provide participants with a qualitative questionnaire (See following page) to be completed before leaving.

Activity Rational and Outcomes.

- Add to findings about how comfortable participants are to work in smaller groups, larger groups and individually.

Tick List (Cont.)

Thinking about the activities we've just done please tell us what you thought.

Which did you prefer?

Working on my own ☐

Working in a small group ☐

Working in a large group ☐

Why?

When you worked in groups, how was it? (tick all that apply)

I had something to say and had a chance to say it ☐

I had something to say but couldn't get a word in ☐

I said something and people listened ☐

I said something and no one took any notice ☐

I had nothing to say ☐

Everyone took part ☐

We worked well as a group ☐

We didn't really work as a group ☐*

*Why do you think this was?

Evaluation Plan.

Photographs and notes will be taken throughout. Peanut will evaluate the activities following each of the three sessions. The following activities build on three previous benchmarking sessions, comparison with responses from those will reflect change.

Split into two groups.

Split participants attending into two groups, it doesn't matter how.

Graffiti walls (words, individually)

Activity Outline.

Two graffiti walls (on two different walls), asking...

- (Thinking back to your expectations before starting the project), "How did it go?"
- Jog participant's memories with some of the types of things they said during the benchmarking session. Things like... pictures/drawing, group work, something a bit different, excited but also trepidation/worry, not sure what it's going to be like.

N.B There is no second Graffiti Wall as there was during the benchmarking session. What participants have learnt and understand about visualisation should come out, specifically, during the following exercises.

Activity Rational and Outcomes.

- To get responses that can be used to draw a comparison with participants expectations from the previous benchmarking sessions.
- Also learn from participants about how the visualisation task went.
- Observe how the participants work in a larger group, in comparison with the later tasks when they will work in smaller groups and individually.

Timeline

This task is to be done by all participants, individually. Take a sheet of flip chart, stick your group (from the task) name on it. Draw a timeline of your project. Start at the beginning (the last benchmarking session) and use your timeline to tell us "What you did?", "When?", "Why?", "How?", Etc.

- Ensure that participants leave things they don't want to share off the timeline.
- Allow 15 minutes to do the timelines.
- Check we understand anything that might be unclear.
- Ask the participant's to take some post-it notes and mark on their three highs, and three lows.
- Thank participants and gather in the timelines.

N.B usually there would be a detailed feedback session but there won't be time to do this and things written could be contentious and so should remain anonymous.

Activity Rational and Outcomes.

- Get participant views about the project, how it went for them and some idea about the process they used.
- Will be used to compare with the graffiti wall, asking about visualisation, during the previous session.

People Map.

Use holidays, something you would take with you, something you would bring back.

- Energiser and split into three groups.

Carousel

Activity Outline.

Three pieces of flip-chart asking three different questions...

- What information could we visualise ?
- Why would we visualise information?
- How could we visualise information?

Activity Rational and Outcomes.

- To get a more in depth assessment of participants understanding of the topic.
- To allow the participants a chance to discuss their thoughts.
- Observe how the three groups work in a larger sized group when compared to individual working.
- Draw a comparison with the responses from the previous session.

Split into smaller groups of five.

H-Form.

In smaller groups consider...

- 'positive'
- 'negative'
- 'changes/improvements'

... to the teaching methods as part of the project.

- Demonstrate the use of a H-Form.
- In groups of five, use the activity to think through the three questions.

Activity Rational and Outcomes.

- Get participant's views about the type of methods used during the assignment and how well they think they were used.
- To observe how participants work in smaller groups.

Tick List.

Activity Outline.

Provide participants with a qualitative questionnaire to be completed before leaving.

Activity Rational and Outcomes.

Fill the tick list for comparison with the previous benchmarking sessions.

(See 'Tick List' above)

Findings.

Attendance.

Over half, thirty five, of the sixty students invited to attend the first set of sessions actually attended. The figure dropped to eleven for the evaluation sessions.

Table 1 Student Attendance

Session	Benchmark	Evaluation
1	17	9
2	12	0
3	6	2
	35	11

Tick List Responses.

The tick list was included to gain some understanding of participating student's perceptions of group work. The same list was filled at the end of the benchmarking and evaluation sessions. It may provide some insight into changed perception as a result of the group work project.

Table 2 Tick List Responses

Question 1, Responses Question: 'Prefer...'

- A Working on my own?
- B Working in a small group?
- C Working in a large group?

Benchmark		Evaluation	
No.	%	No.	%
4	11	1	9
15	43	9	82
0	0	1	9

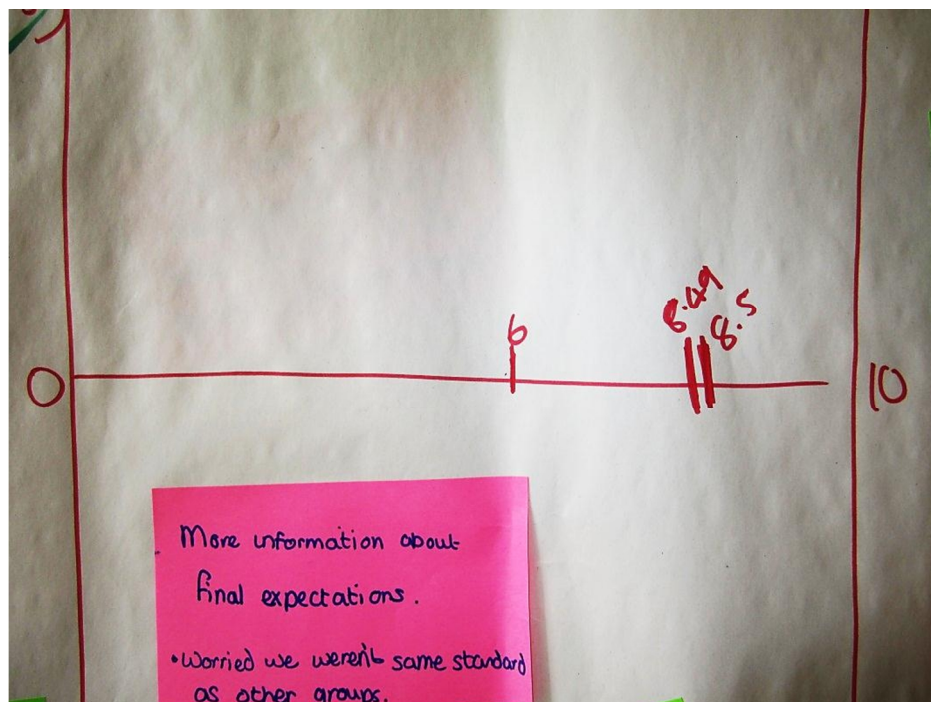
Question 2, Responses Question: 'Group Work...'

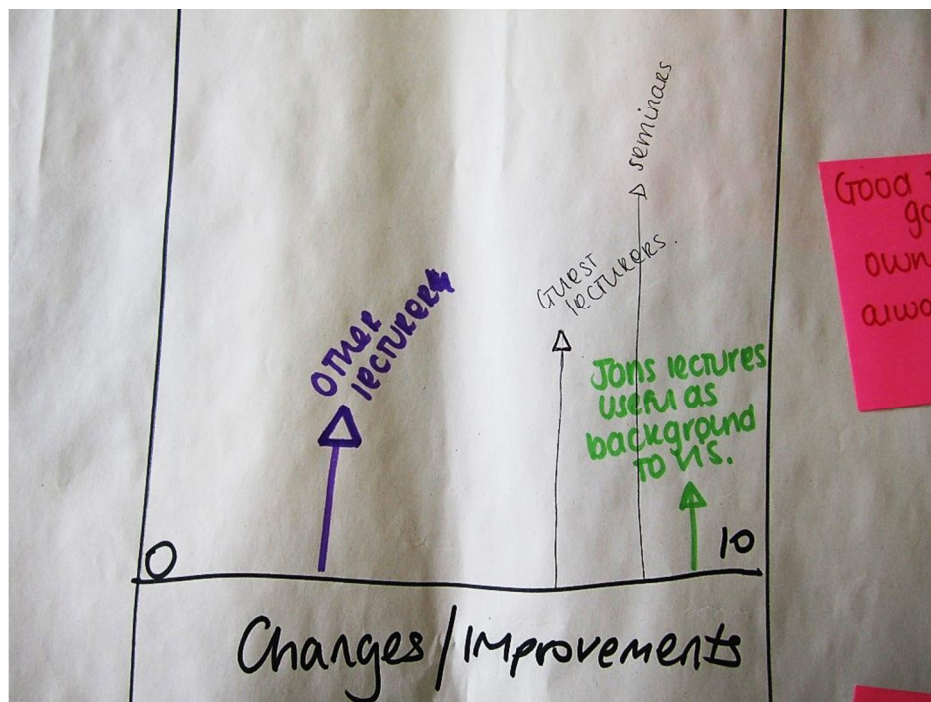
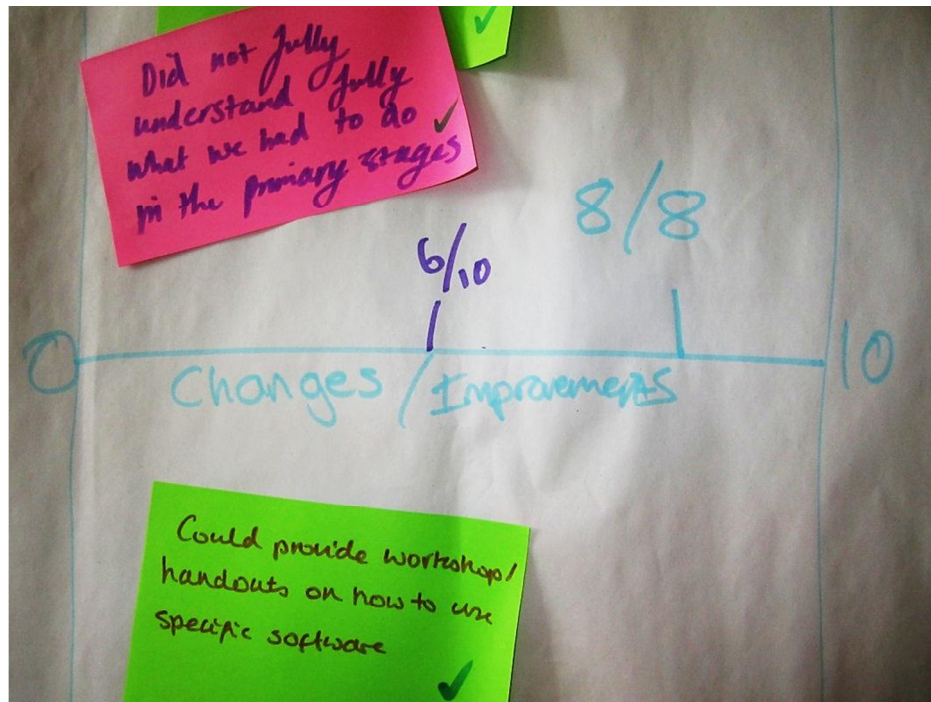
- A I had something to say and had a chance to say it?
- B I had something to say but couldn't get a word in?
- C I said something and people listened?
- D I said something and no one took any notice?
- E I had nothing to say?
- F Everyone took part?
- G We worked well as a group?
- H We didn't really work as a group?

No.	%	No	%
17	49	11	100
0	0	0	0
16	46	10	91
0	0	1	9
0	0	0	0
16	46	9	82
17	49	9	82
1	3	0	0

Evaluation, H-Form Scores

During the evaluation session participants were asked to use a H-Form to tell us about the assignment... the things they felt positively about, negatively about and changes or improvements they thought could be made. Participants were also asked to rate their experience using a mark on a line, in the event students also provided numerical scores between zero and ten. The following images show the scores.





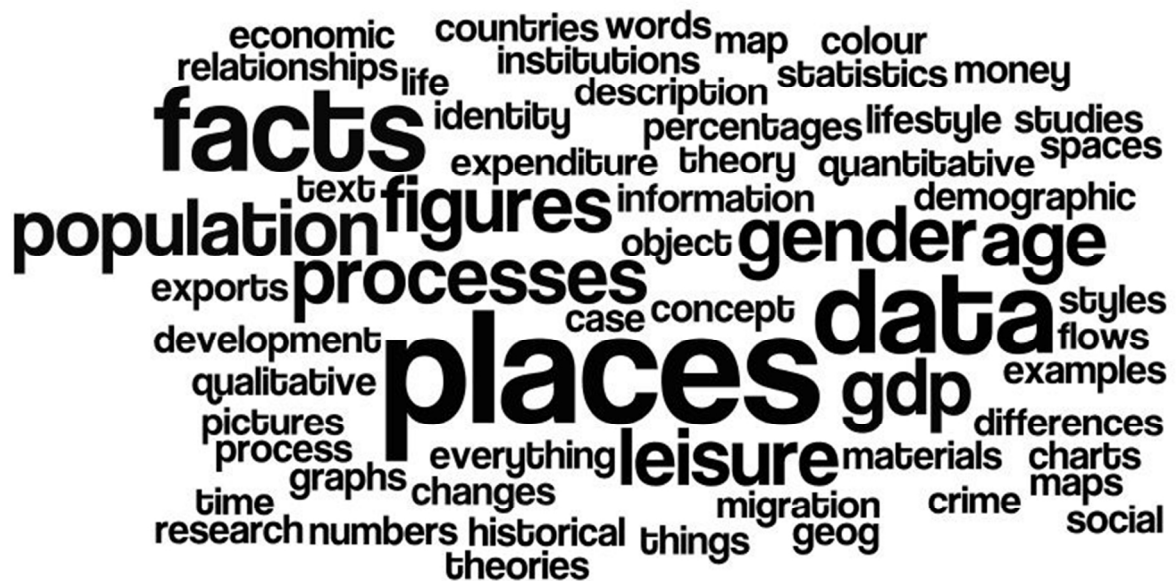
Word Clouds.

Word clouds are a visual representation of a word's relative frequency as it appears in a piece of text. In this case, words that occur more frequently are formatted to appear more prominently. In the first example below for example 'easier', 'learning', 'things' and 'different' occur more frequently than the other words in the original text.

Caution should be exercised when using word frequencies as a way of analysing text data. 'Greater frequency' should not be assumed to indicate or reflect 'greater importance'. Words are also isolated from the original context, possibly leading to meaning being obscured or lost altogether. Finally, a word's frequency in a piece of text is only relative to the words in that piece of text. A difference in the number of words in different pieces of text, for example, are not accounted for.

Word clouds can be useful to make comparisons and as a summary of text data. In this case, between text included as answers to the same question asked in both the benchmarking and evaluation sessions. For example, answers to the first question 'Visualisation, Why?' (see the pair of word clouds on the following page) during the benchmarking session included 'easier' and 'different' as two of the most frequently repeated words. While 'different' retains a relatively high frequency compared with most other words during the evaluation session, 'easier' is repeated, relatively, less often. This might indicate that having completed the assignment, students found the piece of work less easy than they originally thought it would be.

[illegible]

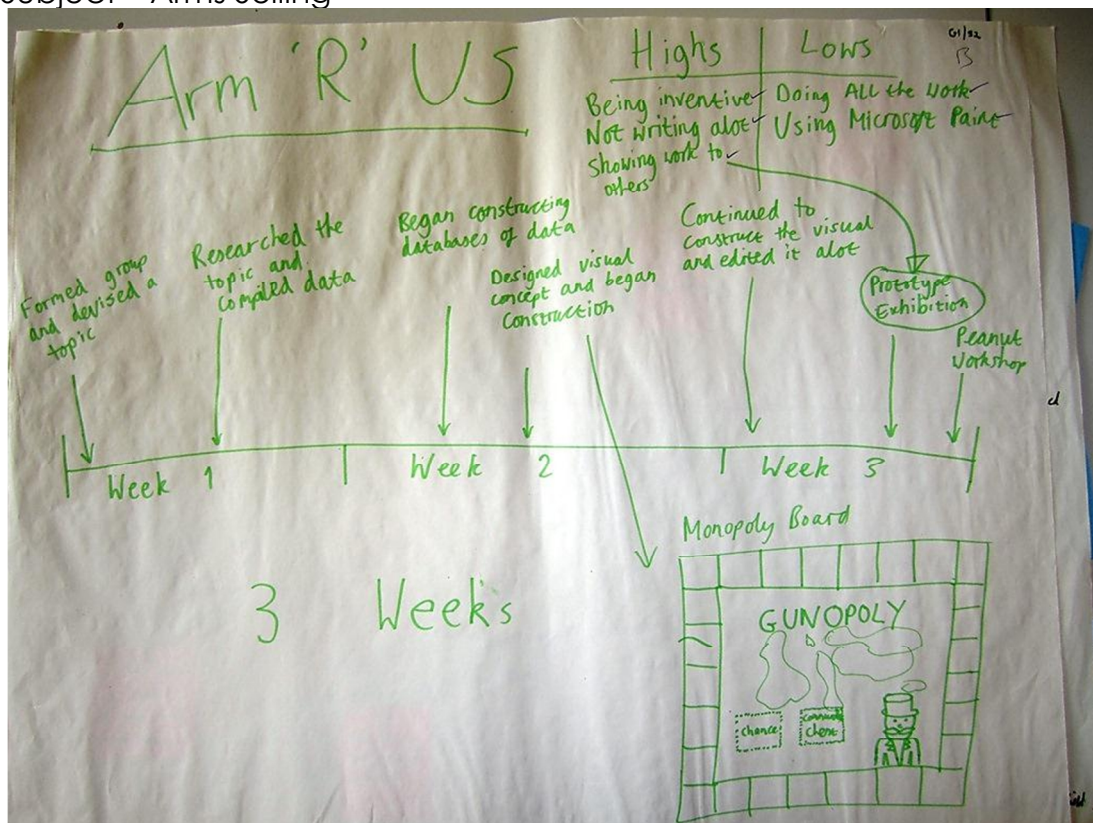
[illegible]

Timelines.

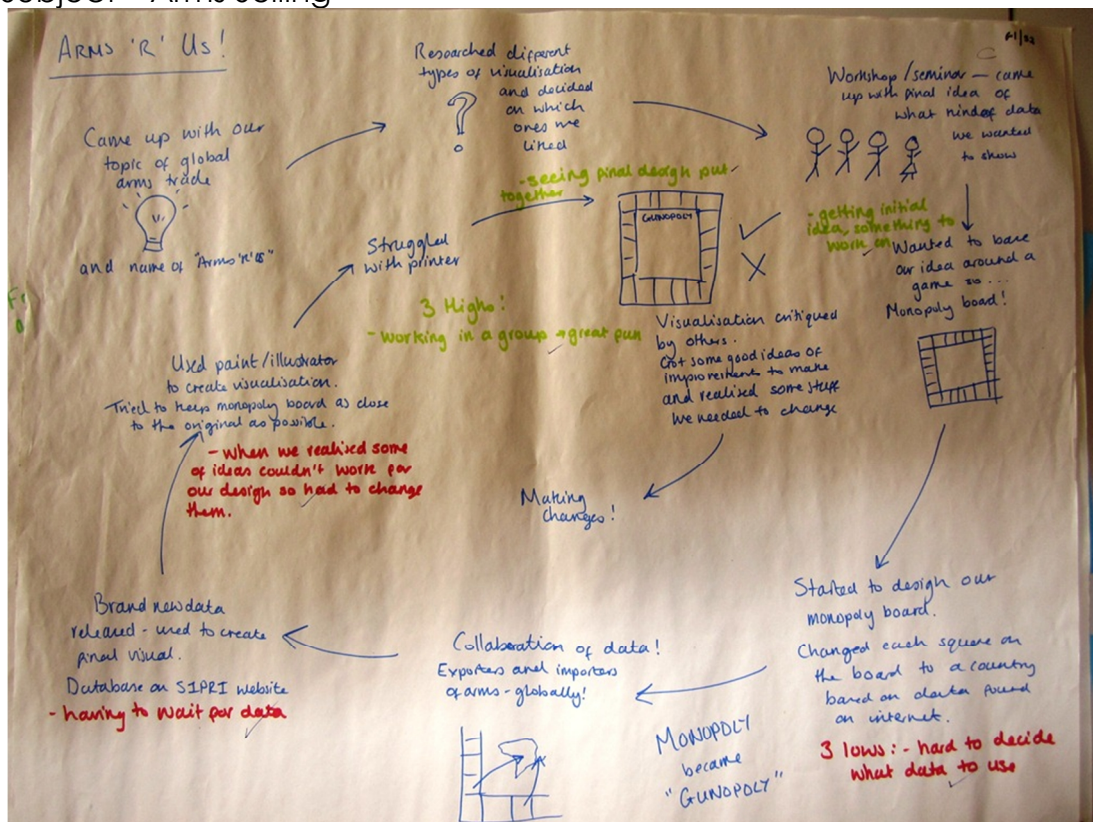
A timeline is an event mapped pictorially (or otherwise) in chronological order. It will often start in the past and can end at any time after. This could be a later time in the past, at the present or into the future to represent a prediction, ideal or hope. The timeline is often also used to help participants think through things that 'went well' and 'went less well'. This is useful for evaluation work and to compare the same chronology from different participants perspectives.

Comparison can only be made between the individual participants of the 'Arms R Us' group. They were the only group that attended the evaluation session in sufficient numbers. However, more general comparisons can be made between the members of different groups. The comments from all timelines have also been grouped into themes as one of the maps in the 'Data Themes' section below.

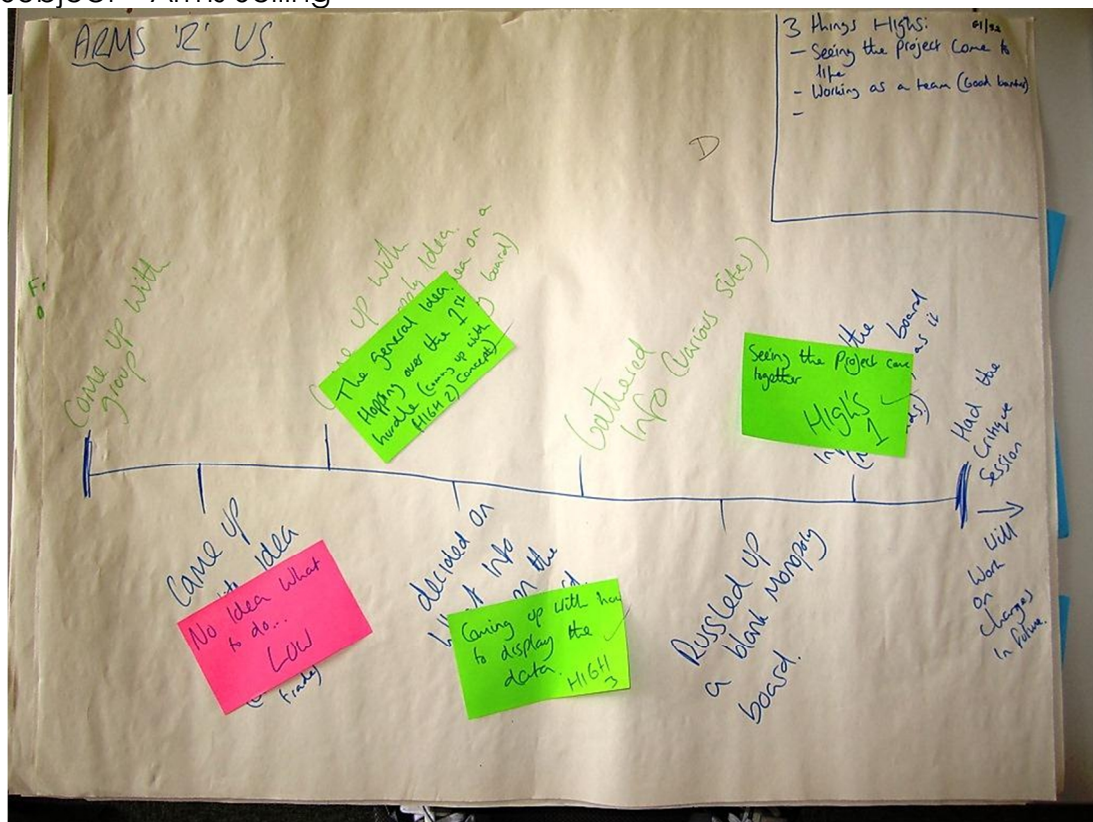
Subject – Arms Selling



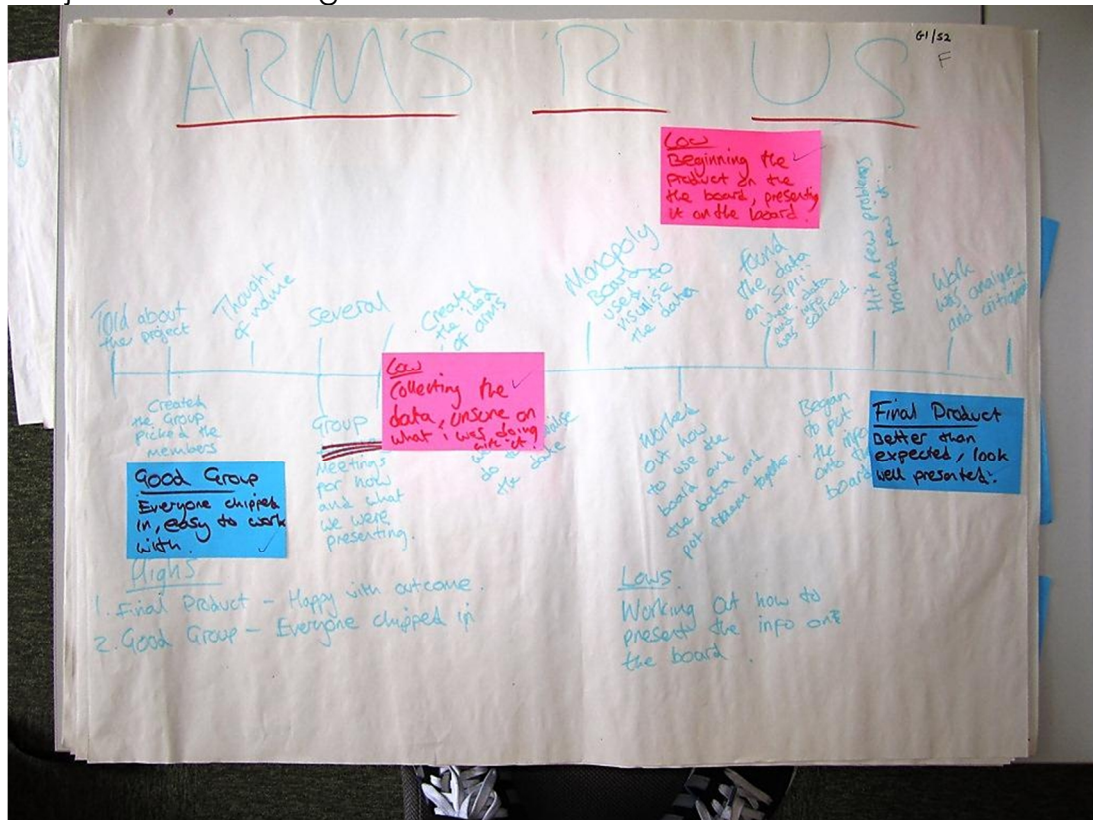
Subject – Arms Selling



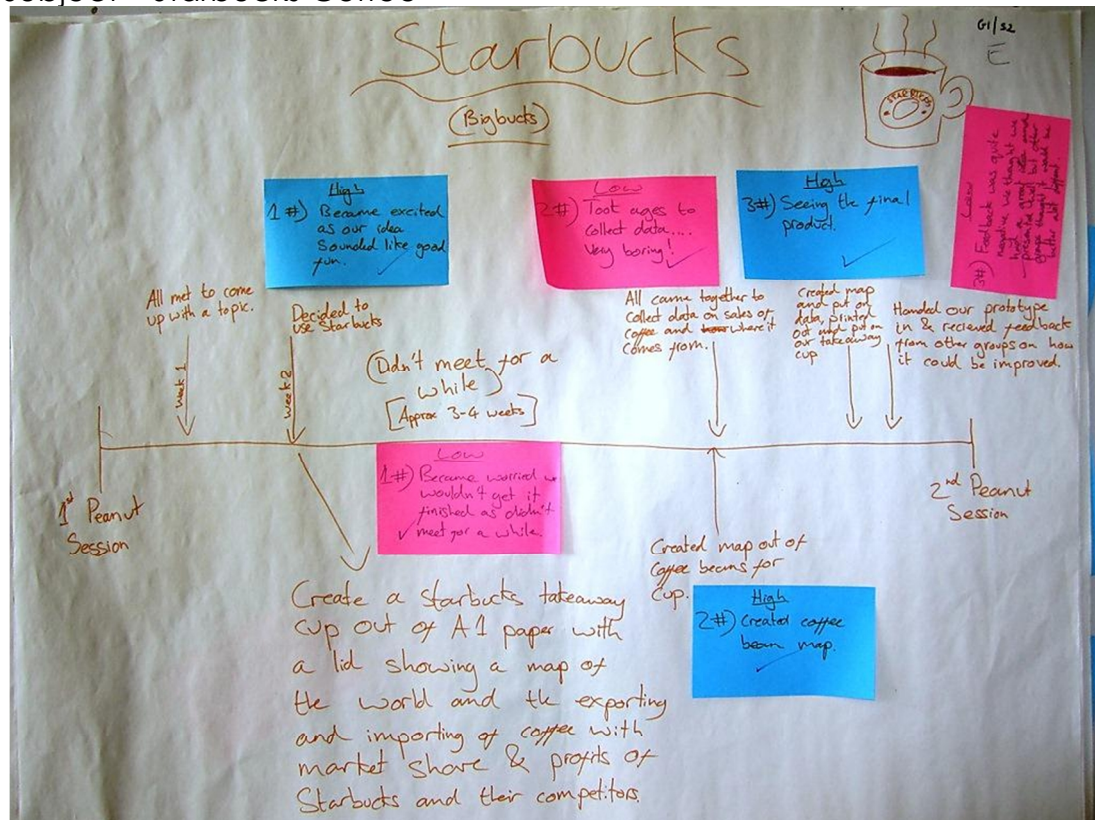
Subject – Arms Selling



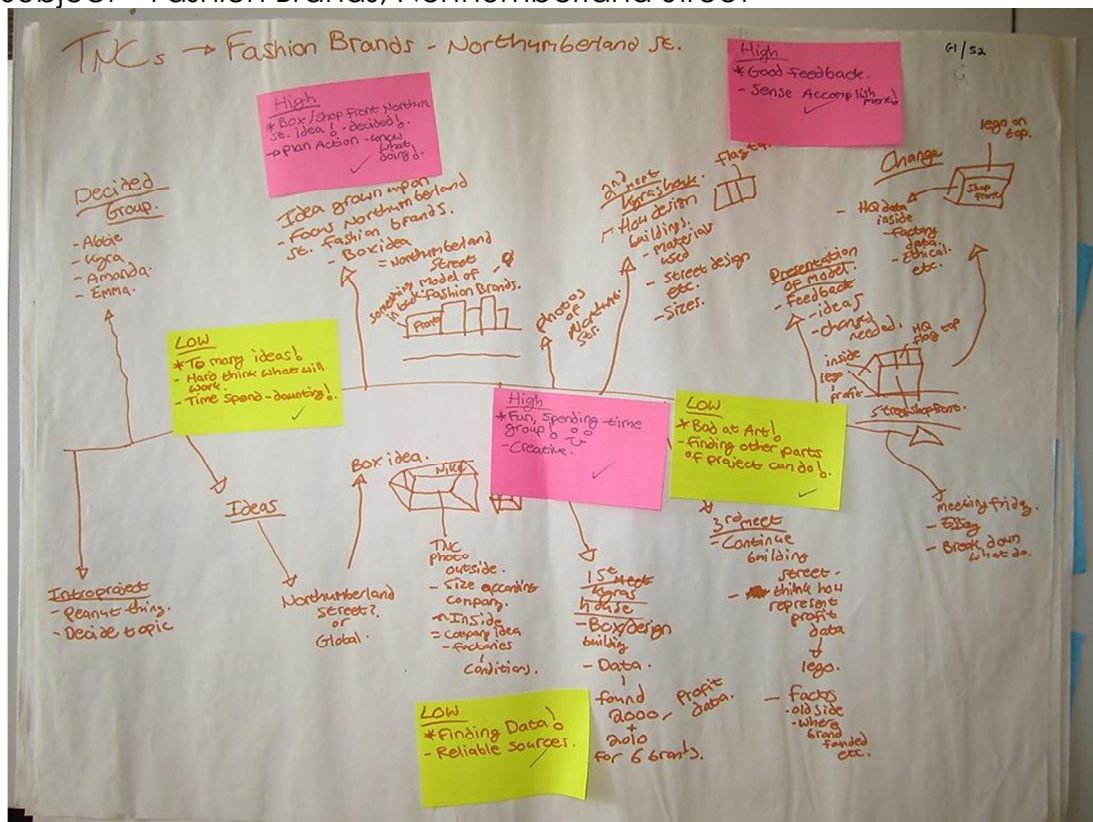
Subject – Arms Selling



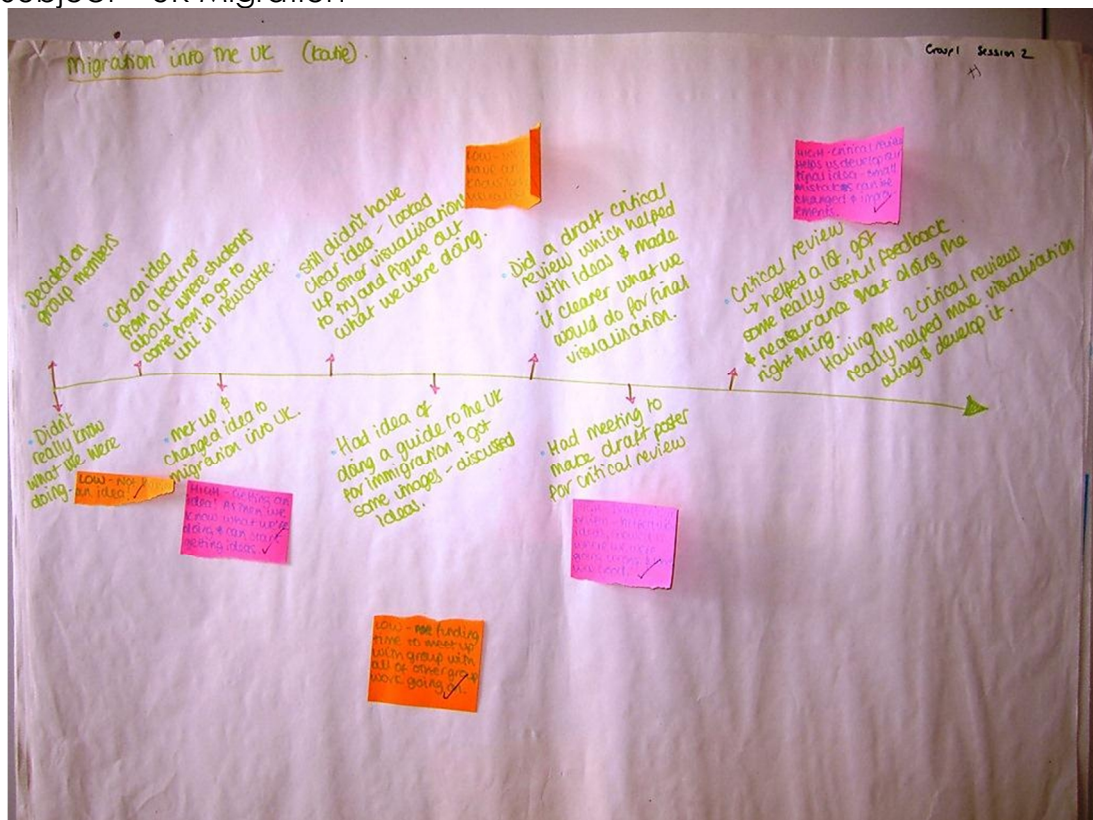
Subject – Starbucks Coffee



Subject – Fashion Brands, Northumberland Street



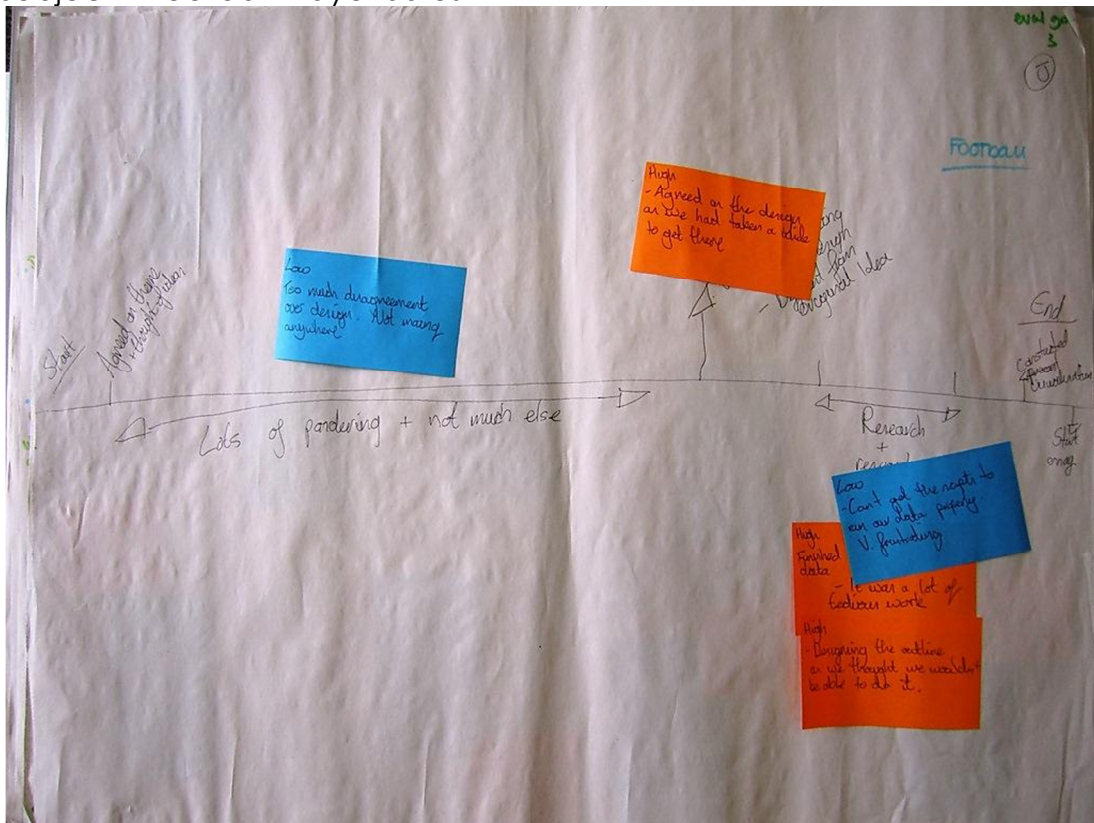
Subject – UK Migration



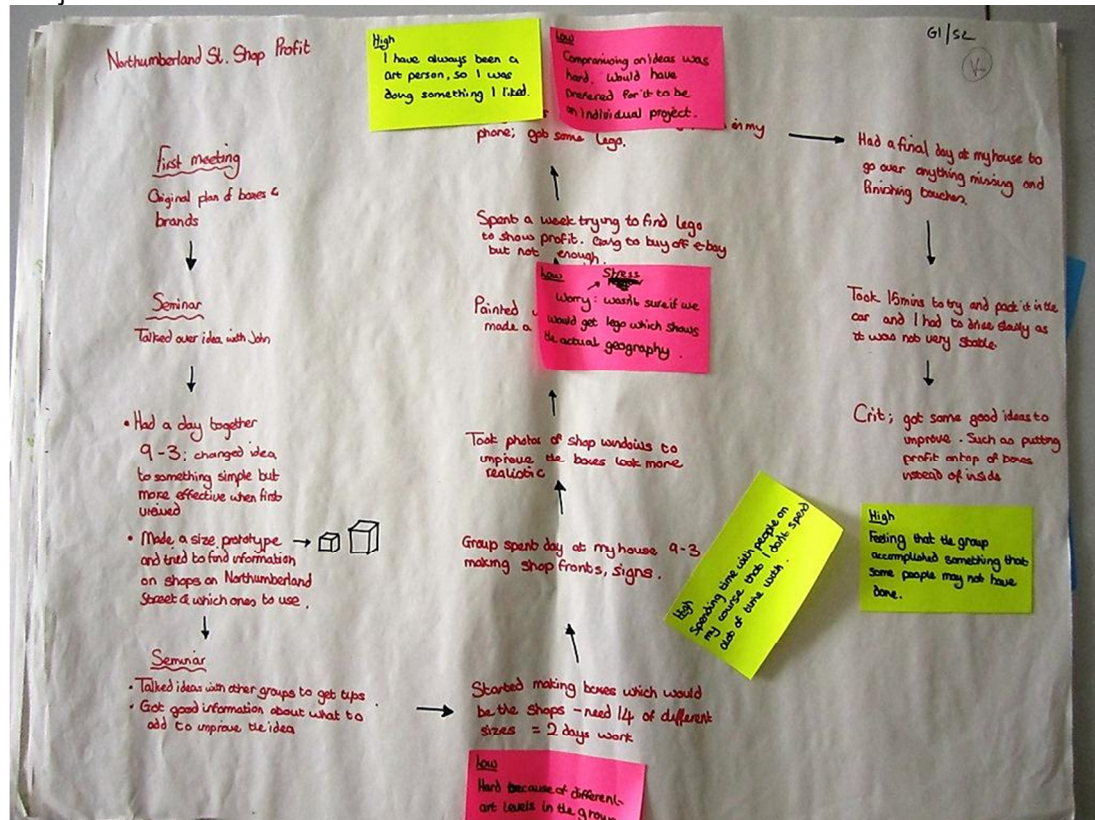
Subject - Olympics



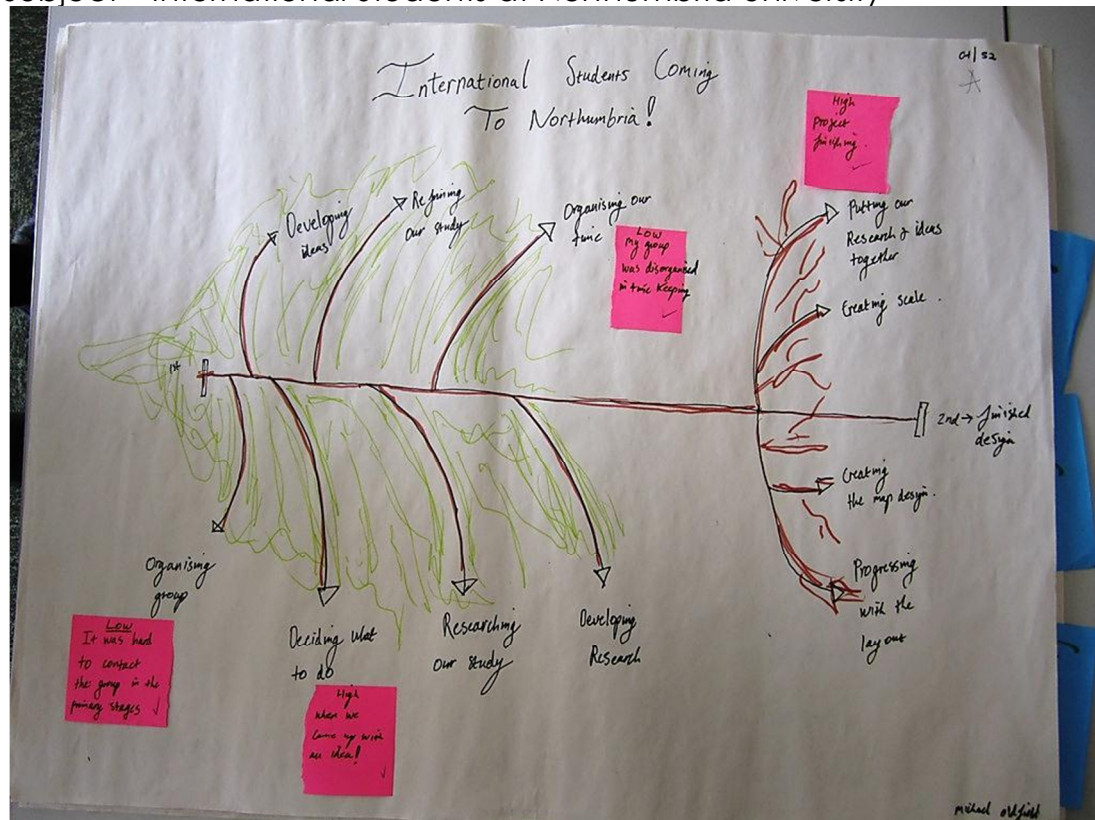
Subject – Football Player Sales



Subject – Northumberland Street Store Profits



Subject – International Students Coming To Northumbria University



Data Themes.

Responses from each of the two sessions and for every exercise was recorded either as digital photographic images or as text comments. The comments are presented as 'mapped' themes as follows:

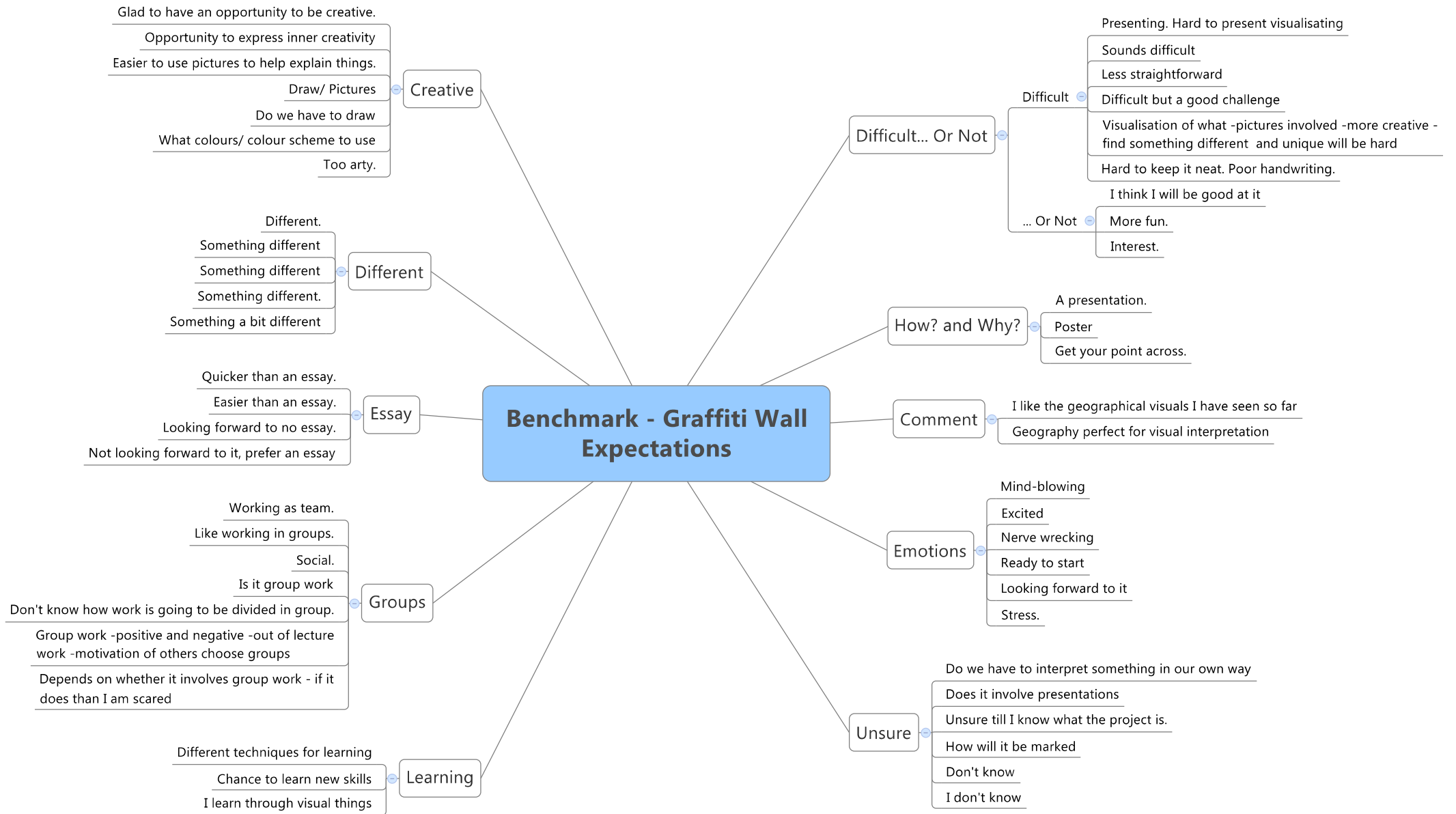
Benchmark...

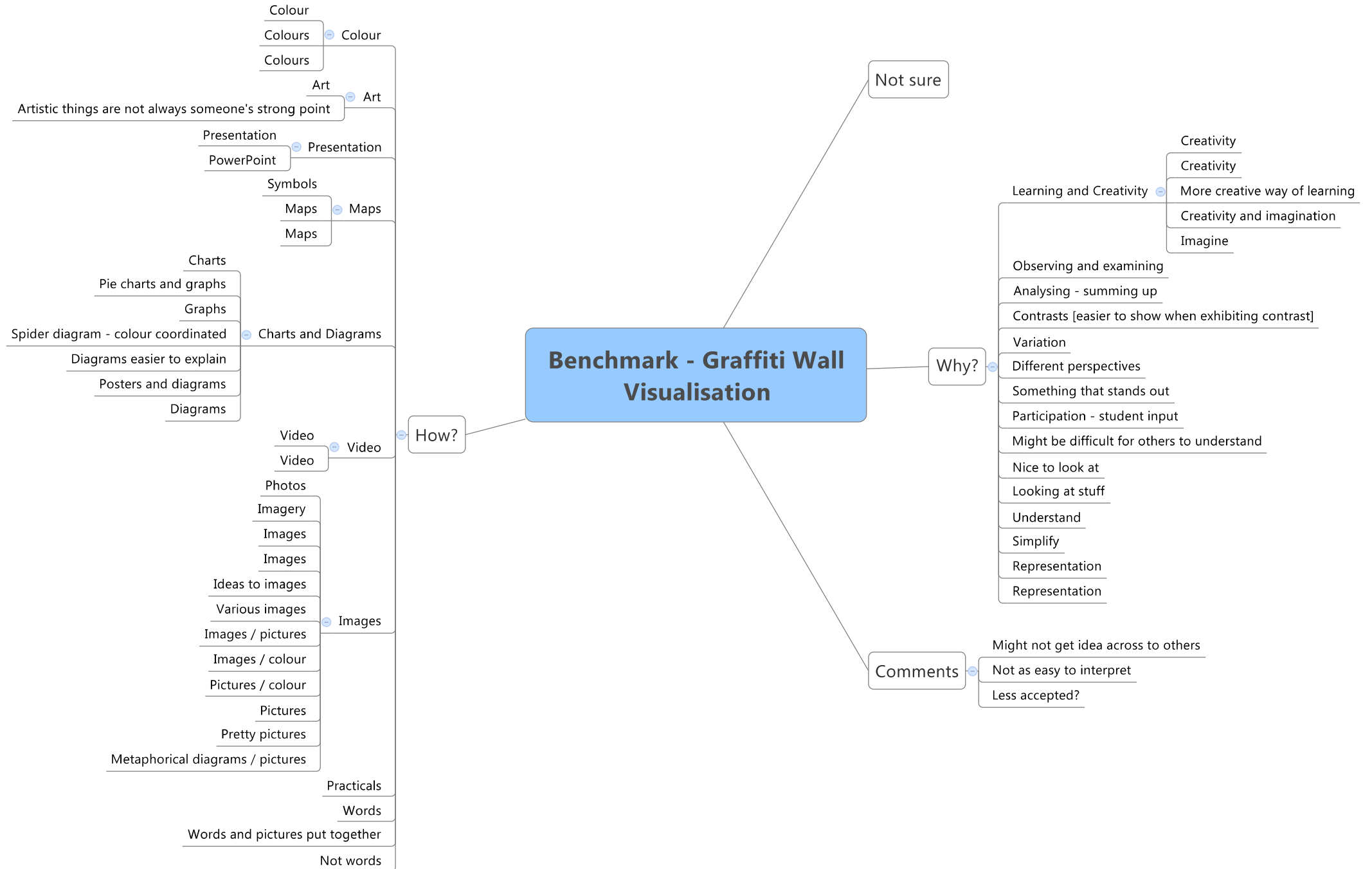
- Graffiti Wall: Expectations. Finding out student's expectations of the assignment.
- Graffiti Wall: Visualisation. How students interpret the word visualisation.
- Carousel: Visualisation, Why? Why students think visualisation is used.
- Carousel: Visualisation, What? What sort of things can be visualised.
- Carousel: Visualisation, How? What ways can things be visualised.
- Impact Rank: Teaching Methods, Most. Teaching methods that students prefer most, and how useful for learning.
- Impact Rank: Teaching Methods, A Bit. Teaching methods that students prefer a bit, and how useful for learning.
- Impact Rank: Teaching Methods, Least. Teaching methods that students prefer least, and how useful for learning.
- Tick List: Comments. Comments supplementing the questionnaire.

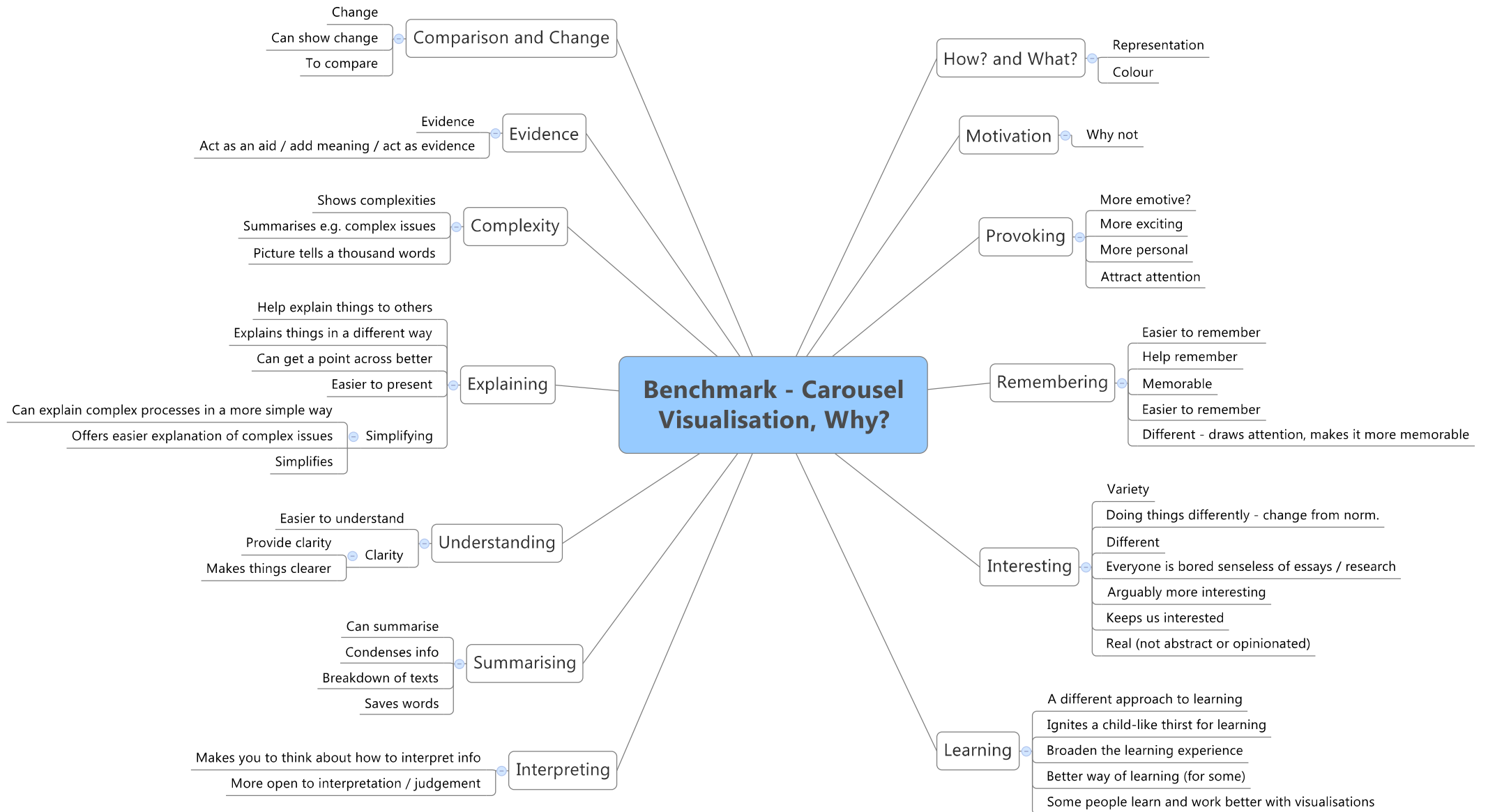
Evaluation...

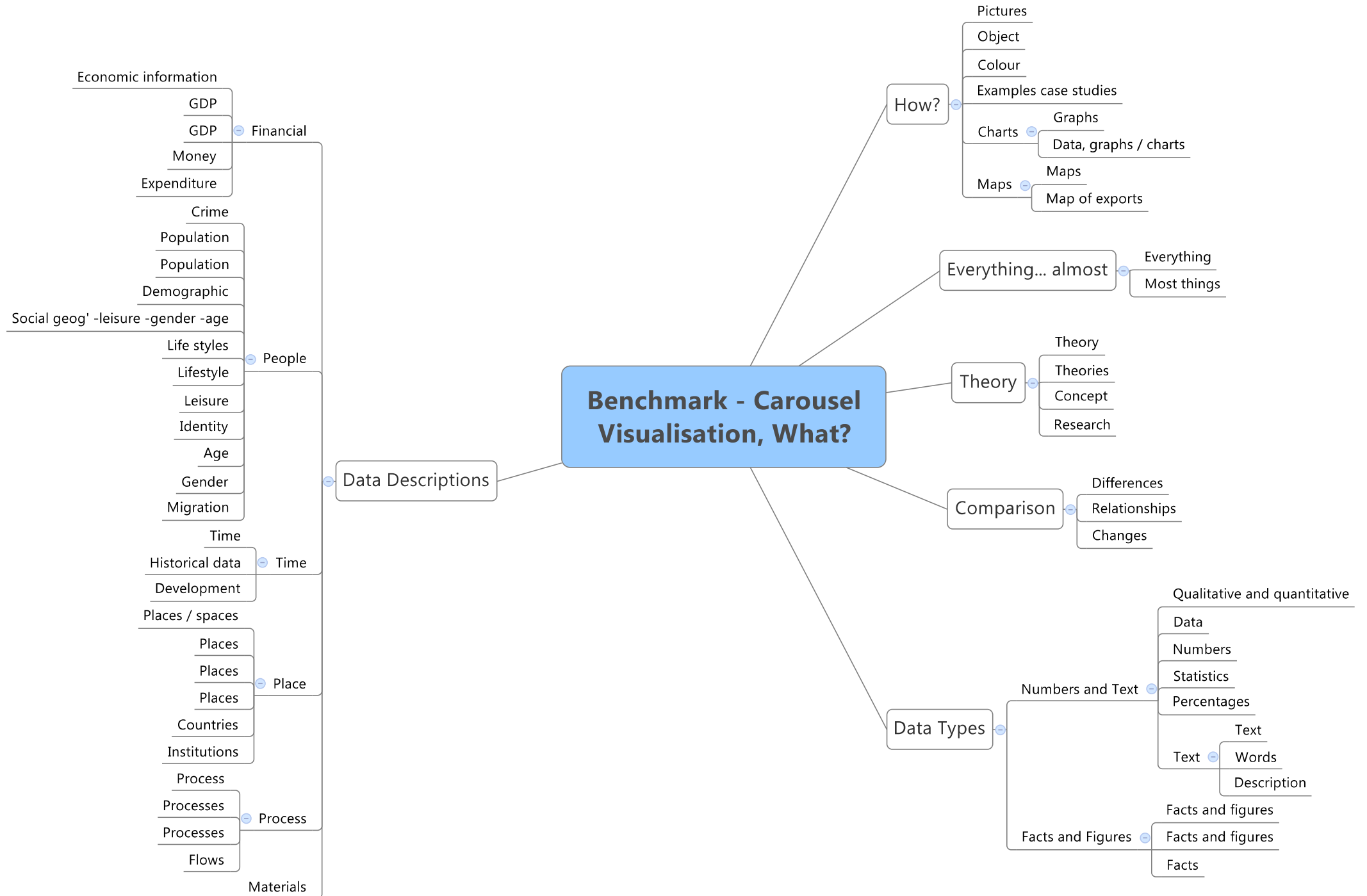
- Graffiti Wall: Assignment. Asking students for any general comments about the assignment.
- H-Form: Assignment. Asking students for more specific comments about the positive and negative aspects of, and changes to, the assignment.
- Timeline: Assignment. Individual project timelines supplemented with comments about 'ups' and 'downs'.
- Carousel: Visualisation. Revisiting the 'benchmark' carousel asking about visualisation 'why?', 'what?' and 'how?'.
- Tick List: Comments. Comments supporting the quantitative questionnaire scores.

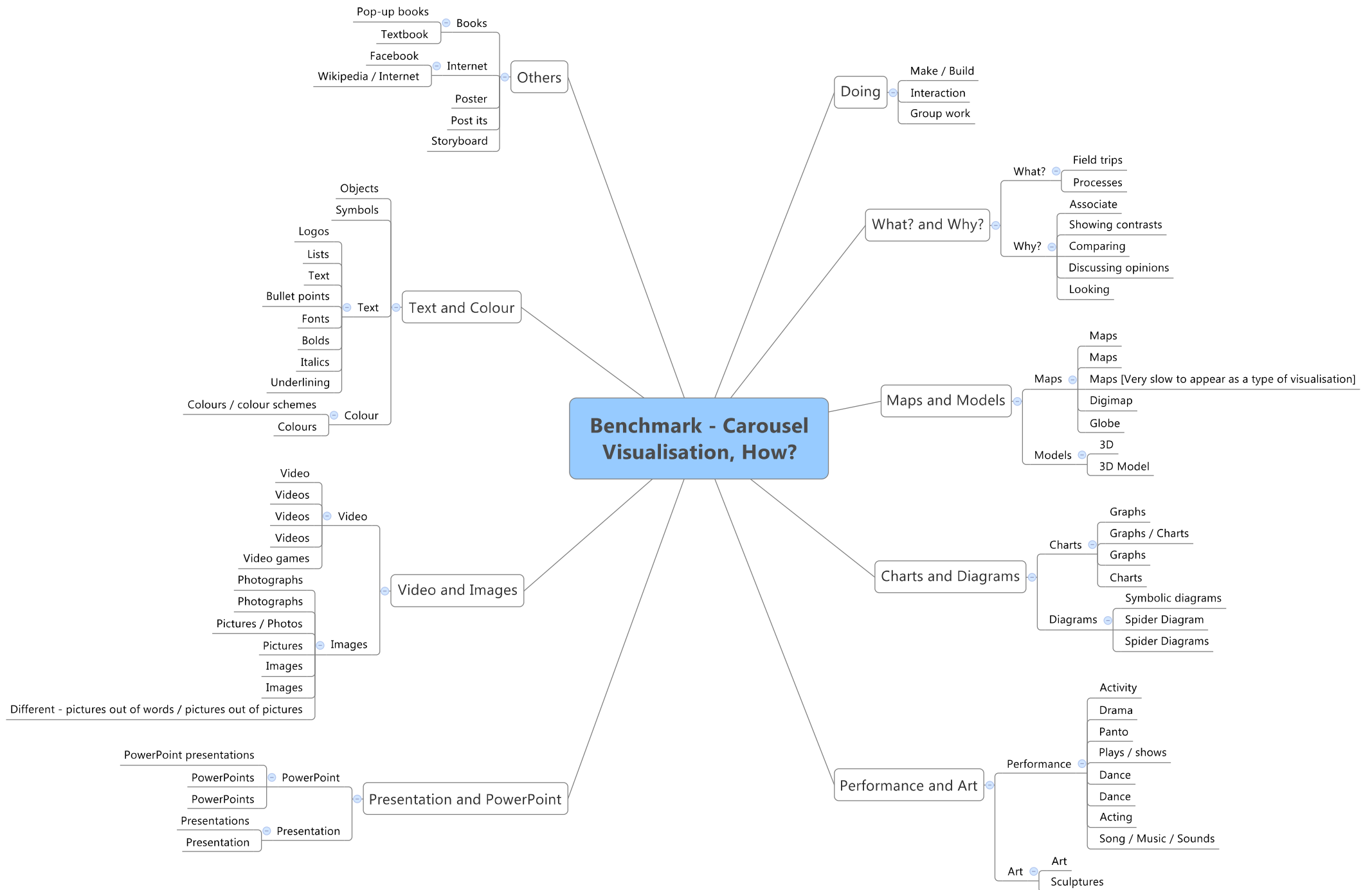
The comments appearing at the end of each 'leg' of the theme maps are participant's verbatim responses. Working back towards the centre of each map are the data 'themes' which group similar responses and provide a way of structuring responses for analysis, drawing out meaning and facilitating reading. In some cases there are different theme levels, moving from less specific groupings through to more specific groups of responses. The themes were chosen by the researchers to represent the data, not by the participants.

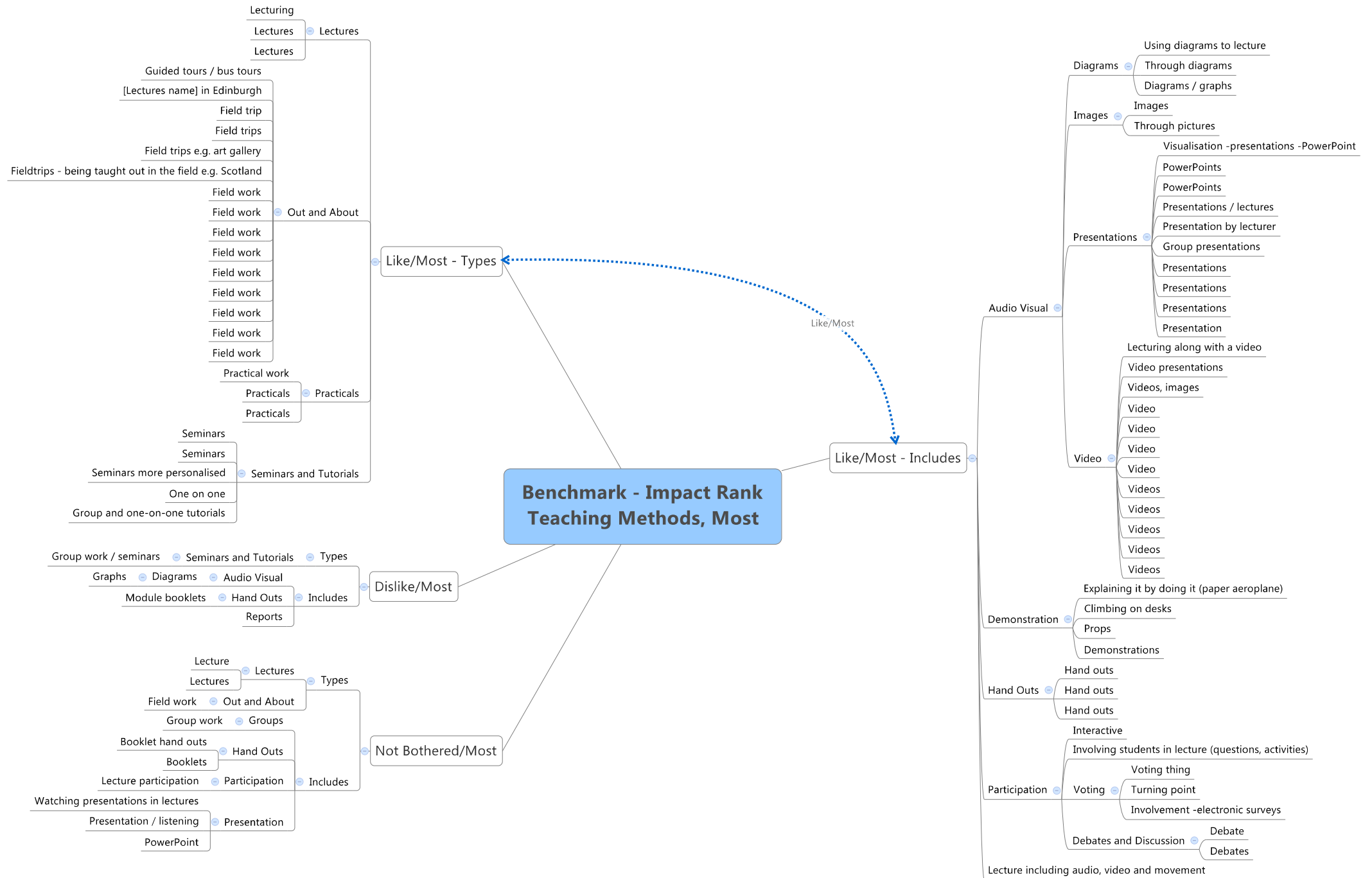


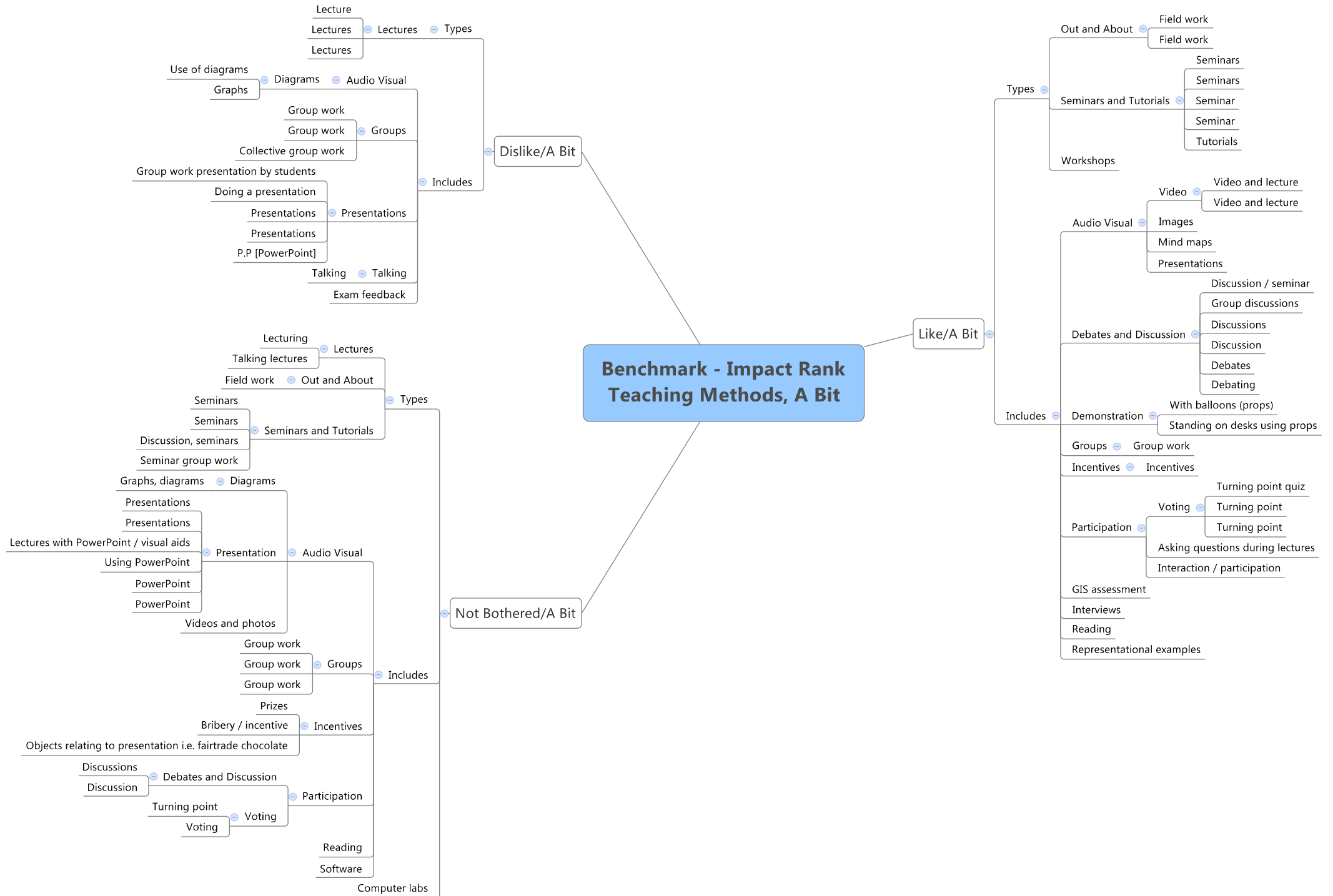


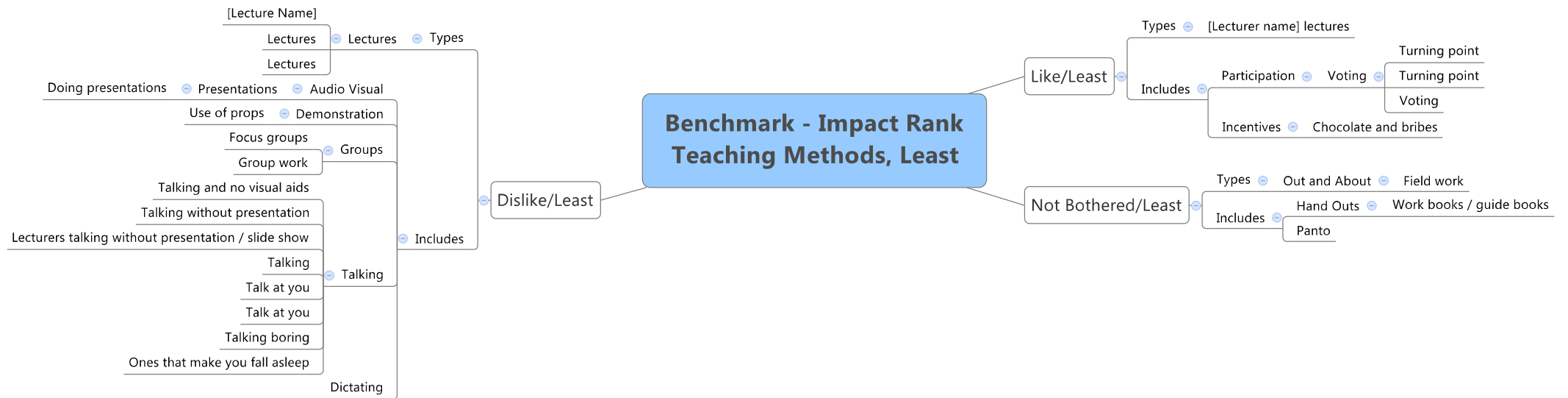












Benchmark - Ticklist Comments

Group-work, Preference?

On Own

Peanut 2011
Independent thought, though groups your opinion can be silent

- Think for yourself, don't get influenced
- Prefer working on own but like the change
- Other contributions
- Different from norm
- Large group can be too much, unorganised
- Experience what you may miss

All from same person

Ideas

- Able to talk, share ideas.
- Allows you to get other people's ideas
- Get other ideas more intimate
- More ideas, with not too many people talking. More detail to answers.
- Ideas from others

Variety

- Variety of opinions
- More interesting than individual work, more inputs - not stuck of thinking of answer on your own.
- Met new people on the course
- Gives other inputs to produce better ideas and broader outcomes
- Prefer working on own but like the change
- You get different inputs and encourages everyone to contribute

Small Group

Interaction

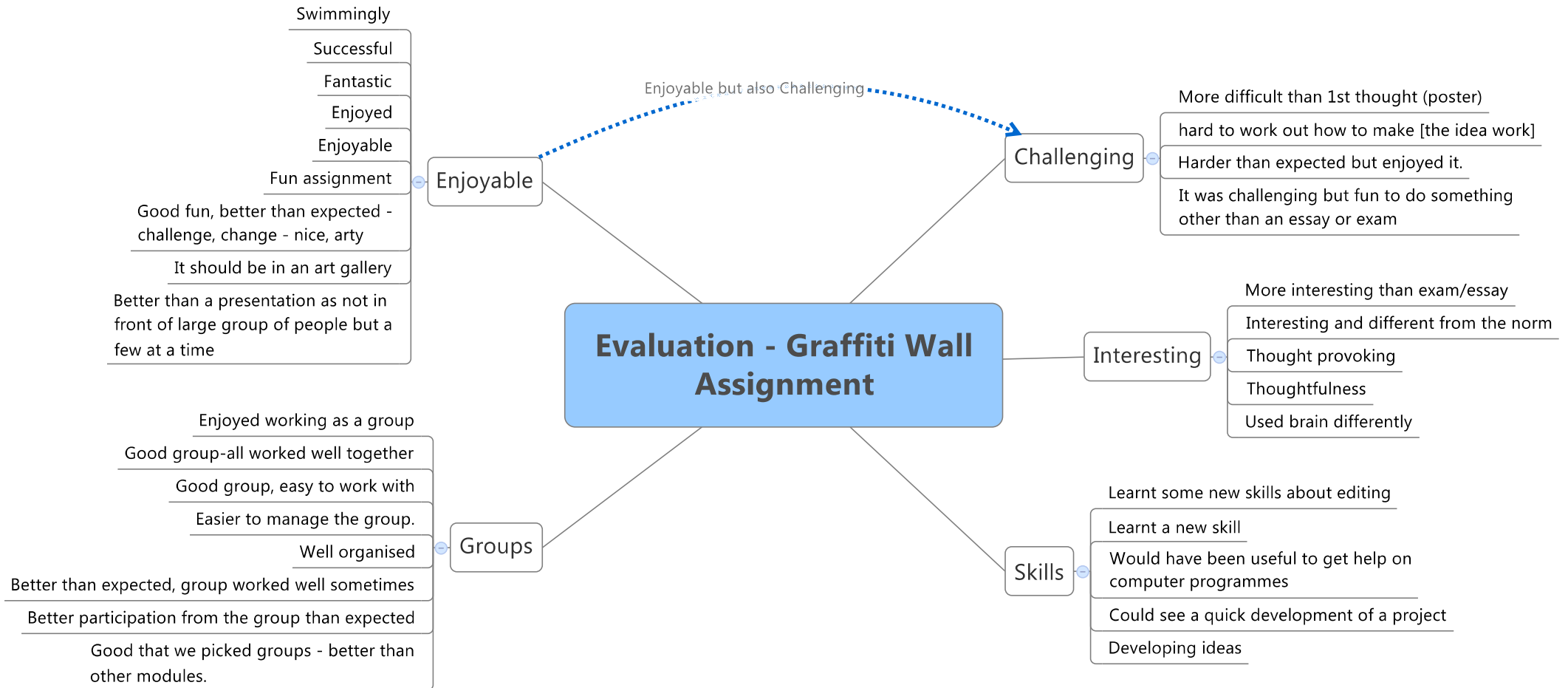
- Interaction
- Talked more, everyone had a chance to say things
- Not too many people trying to give inputs at once
- Enjoy working with people
- Prefer to have everyone's input
- Can have a reasonable discussion without any hectic noise
- Everyone gets a good chance to give input
- Easier to interact and have a say
- More personal level everyone listens
- Easier to interact, good to share ideas and thoughts

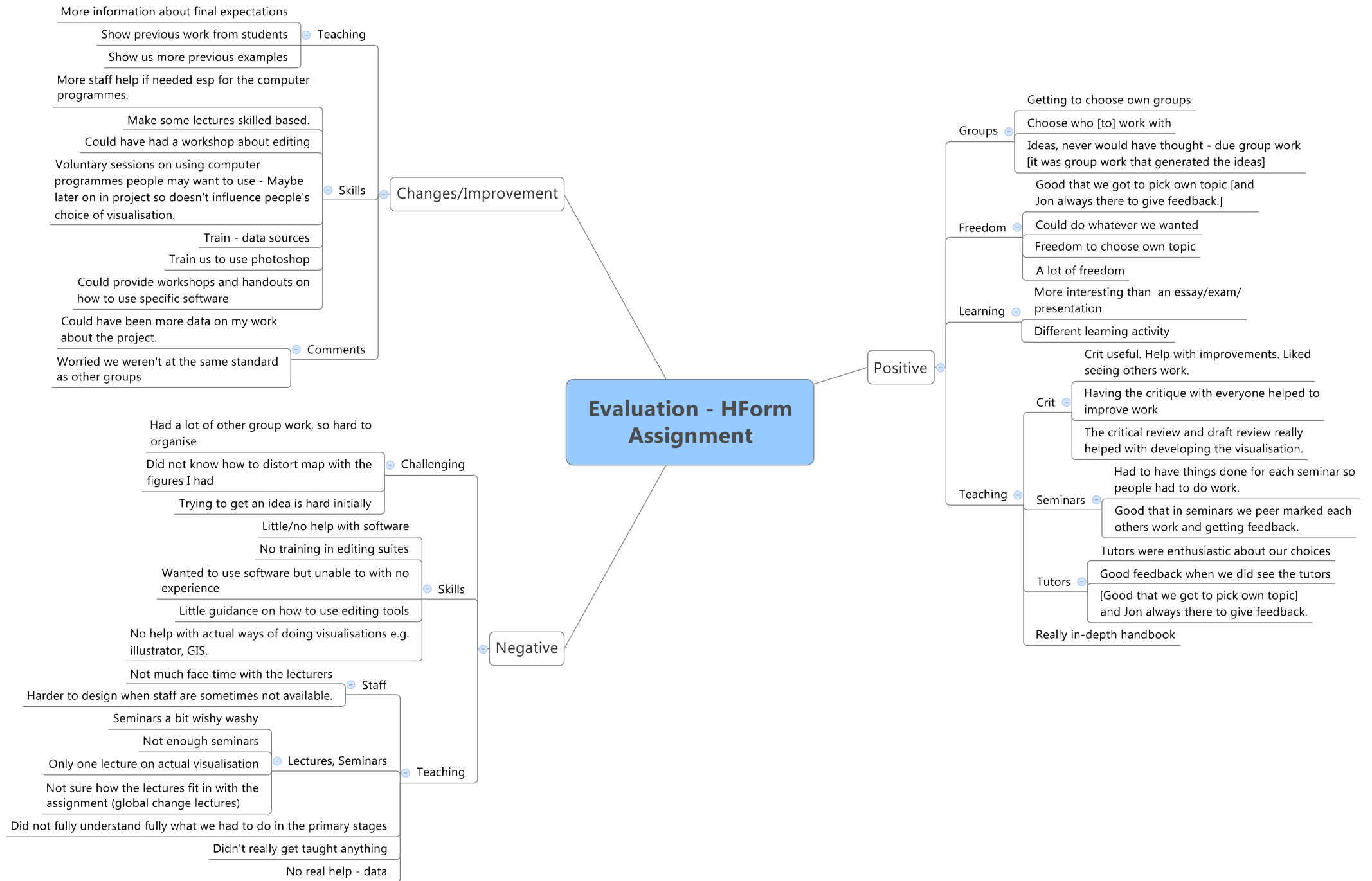
Confidence

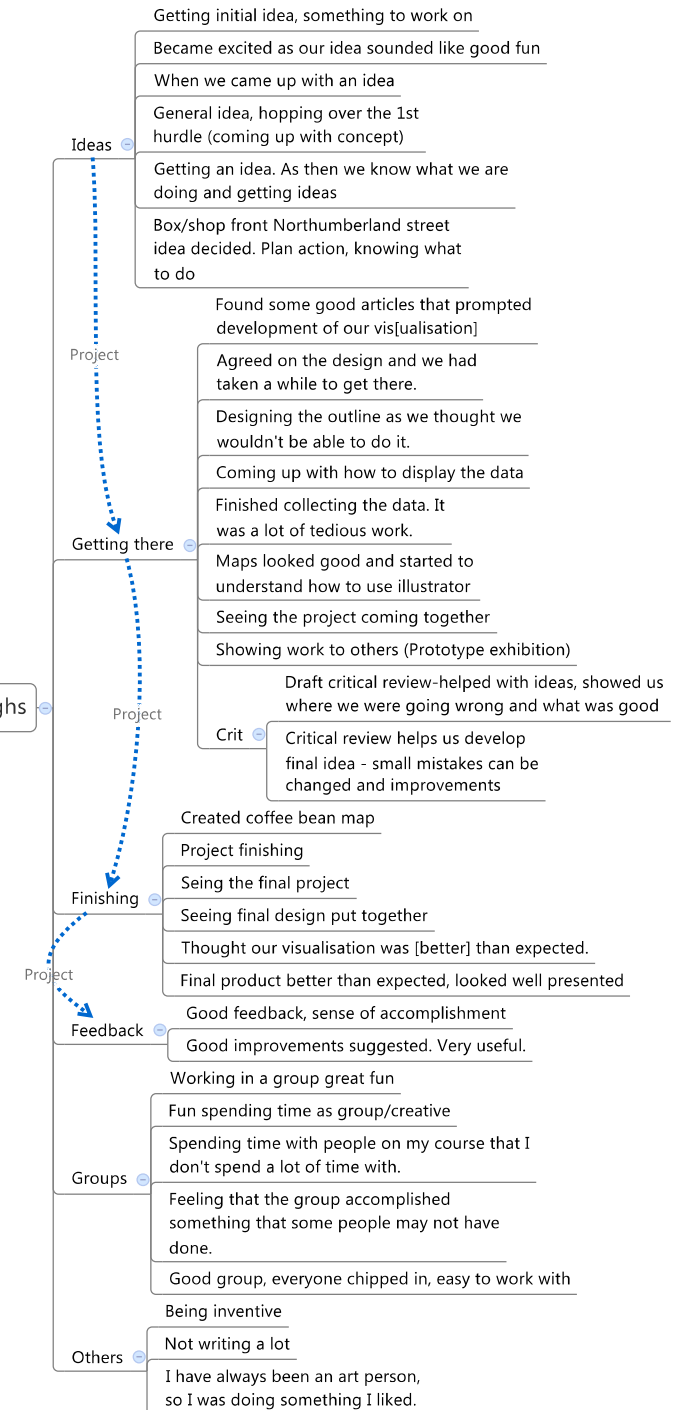
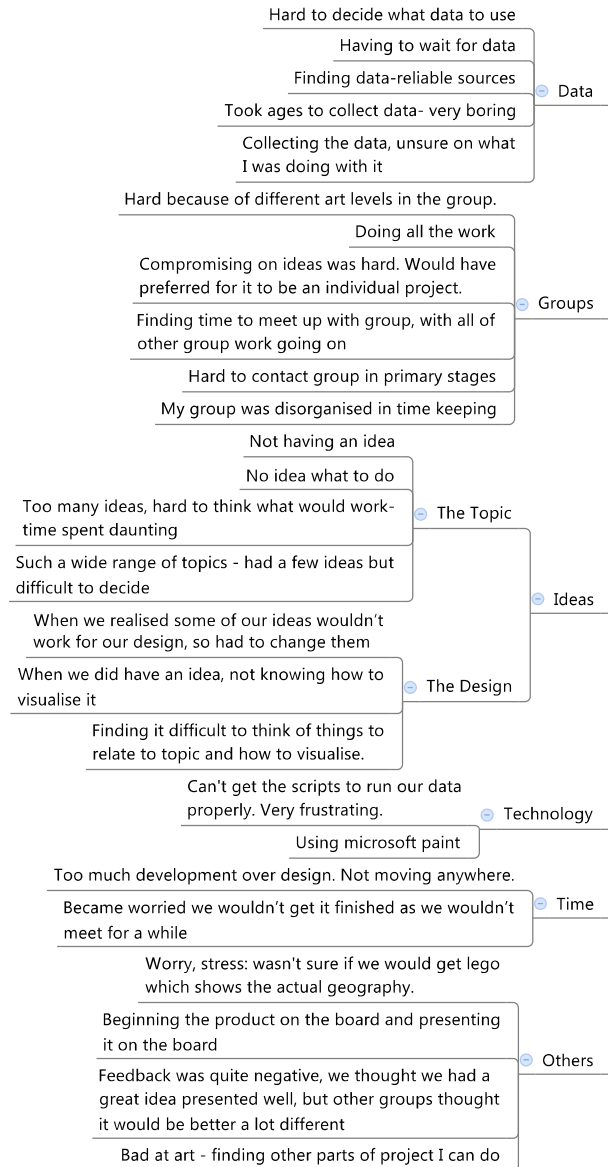
- Less intimidating
- Allows you to feel more confident speaking out and contributing ideas
- Large groups - can be difficult to get points across and fear of saying something
- Good to get into habit and feeling relaxed in group work

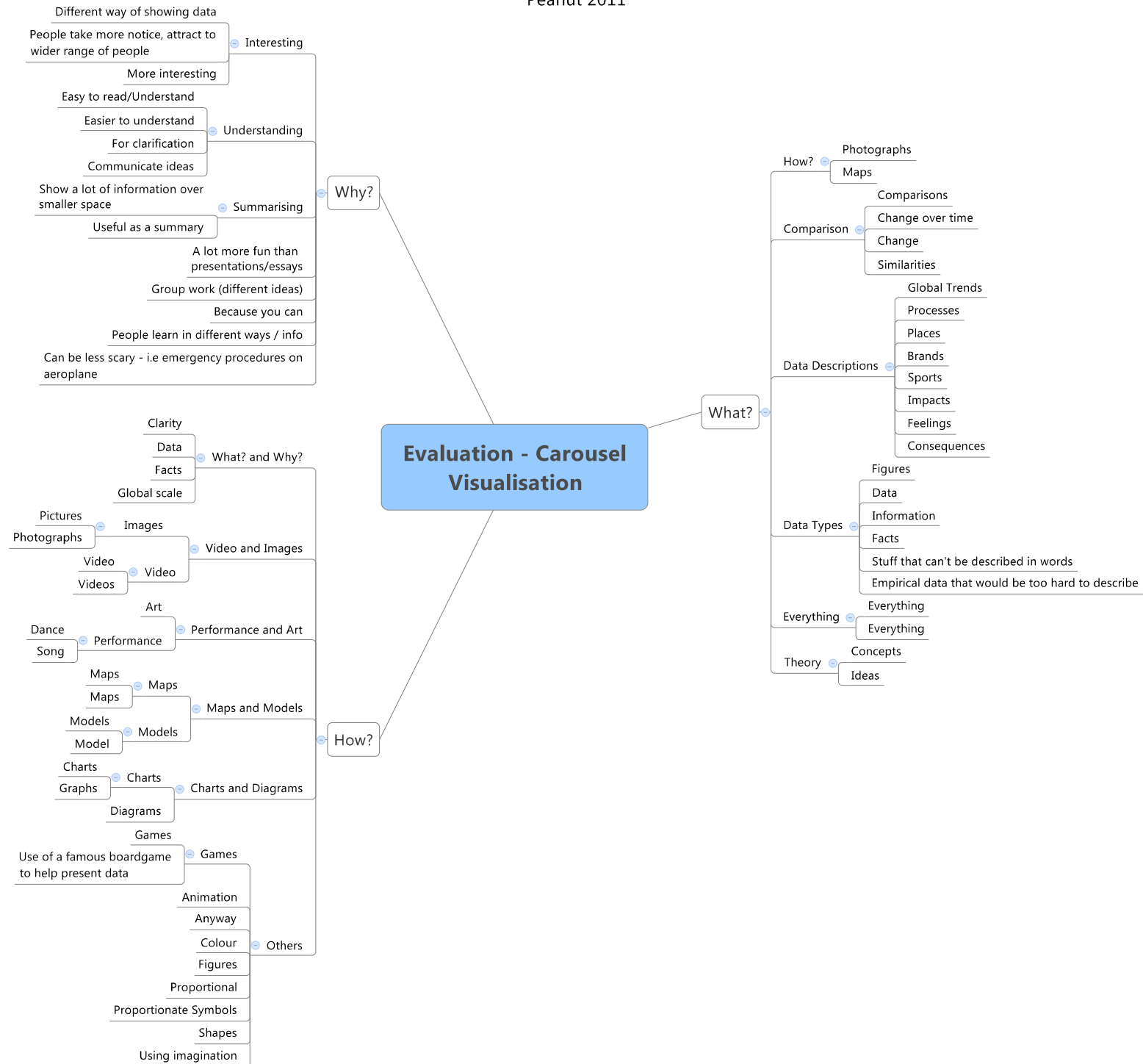
Group-work, Why?

- Small groups so no one was talking over each other
- Using visualisation
- Because the task just involved coming up with your own ideas
- For this session the people that turned up are the ones wanting to work and participate in









Evaluation - Ticklist Comments

Group-work, Preference?

- On Own - Because I am responsible for my grade and I know how much effort I need to put into it
- Small Group -
 - Get to work with others, but group is small enough so nobody gets left out. You can all express your ideas
 - Ideas -
 - Make ideas heard-more discussion
 - Bounce ideas, not too many people to annoy you
 - Was good that we could discuss in small group. Everyone able to contribute and share ideas. Prompted good discussion. No-one felt uncomfortable speaking.
 - Was good to share ideas and not do it on our own, especially for something creative, such as the visualisation
 - Collaboration -
 - Allows responsibility to the individual but allows collaboration. Work Gets done.
 - If you can choose your own group, relaxed working atmosphere
 - In a small group people don't fight for control as much
 - Everyone gets involved and has an input
- Large Group - As there was less work, however everybody could help develop the project in some way whether being software or writing skills

Group-work, Why?

- Picked our own group with friends, don't want to let others down
- As I did this was useful
- Got along
- Friends previously so good communication