Setting Ground Rules for Teamwork

'A team is a group of people with complimentary skills who are committed to a common purpose and hold themselves mutually accountable for its achievement'.
Katzenbach and Smith: 1993, The Wisdom of Teams

Stage 1: Agreeing on a set of ground rules
Team members may wish to consider their experience of working in a team and what ground rules they think they should put in place to promote the appropriate behaviour and attitude to, for example, roles and responsibilities.

Stage 2: Applying the ground rules
Once the team has set out their ground rules it is useful to group the ground rules into the three categories listed below. This should raise awareness of the interdependencies between:

- the individual – for example, how are they fulfilling their role in the current exercise?
- the team – for example, is the team telling individuals what to do or reaching a consensus about what work should be done;
- the organisation or management process which is needed to underpin successful teamwork – for example, what are the procedures used to ensure that the work is planned so it is completed on time?

Ground rules generally fall into three main categories namely:

1. Team culture
   This category deals with the promotion of an environment beneficial to team working, and therefore the behaviour of the team to the individual.

2. A team member's responsibilities
   This category deals with an individual's behaviour within the team.

3. Team organisation
   This category deals with those generic management activities which should underpin the work of any successful team.

Examples of typical ground rules
- Team members must notify the other members if they are going to be late or absent;
- Everyone must be given a chance to speak;
- Team members will respect one another and not be rude...

Note
The team should revisit their ground rules when appropriate.

University of Manchester

School of Mechanical, Aerospace and Civil Engineering

Semester 2: 2013

Project Managing Humanitarian Aid

MACE 62002

Supplementary Materials and Exercises

This booklet contains a number of supplementary materials designed to support the processes involved in this approach to learning. Some of the initial sections are about individual processes - how to reflect, how to search the literature - whilst many of the later ones are concerned with the process of working together in a group. There are some exercises included in the materials and the group facilitator will go through some of these with the group.

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Reflective Practice

Your learning from this unit is recorded in an assessed "Individual Reflective Report", also known as a learning diary, for which you should make written notes regularly throughout the course unit. Instructions are provided in more detail in the Assessment briefing and you can use the blog section of the course pages on BlackBoard to help you record your experiences. There is also a presentation on BlackBoard to help your understanding.

The Reflective Loop

The process of reflection as a professional self-development tool involves:
(i) describing an event,
(ii) critically analysing the experience or situation,
(iii) devising action points for implementation with the aim of achieving a desired or improved outcome in future and then, to complete "the reflective loop"...
(iv) ...describing the consequences of those action(s), positive or negative to start the next cycle of analysis and planning actions.
(v) critically analysing, etc, etc

The purpose of reflection is for you to learn how to pro-actively tackle problems and reinforce positive processes and behaviours in a systematic way.
Marks are awarded for identifying issues and making attempts to effect change through identifying actions and putting these into practice, whether or not the actions later turn out to be effective.
Your individual reflective report records the journey you take throughout the course-unit rather than the final outcome, or your overall success in any area.

(1) REFLECT ON A PAST EVENT

Working in pairs, interview your partner to draw out their reflections about an event and subsequent learning and change in actions (choose A or B). Then swap.

The purpose is to be honest – you are not being interviewed for a job here, you do not have to impress, just demonstrate that you can analyse and learn from positive and negative experiences.

(A) Briefly describe when something didn't work out as well as you'd hoped.
Q1) Looking back, why did you think that happened? (Were your aspirations realistic?) (ANALYSIS)
Q2) Whoever you think was to blame - what, with hindsight, could you yourself have said or done differently to produce a more satisfactory outcome? (ANALYSIS)
Q3) What do you think you learned from this that you could apply in future? What three tips would you give yourself if you could go back in time to before it happened? (ACTION POINTS)
Q4) What practice or learning could you find to help you avoid this problem in future? (ACTION POINT)

(B) Briefly describe a time when, working with others, what you did made a big difference and was instrumental to a good outcome.
Q1) Looking back, why did that happen? Was the success due to luck or skill or both? (ANALYSIS)
Q2) What, with hindsight, did you personally do to bring this about? What specific skills or knowledge did you use that made this different to other situations you've been in? (ANALYSIS)
Q3) What did you learn from this that you could apply in future to ensure a similar level of success? What three tips would you give yourself to remember to apply? (ACTION POINTS)
Q4) Have you experienced a similar scenario since? If so, how did that work out? (CONSEQUENCES)

Dealing with Conflict

Stage 1: Conflict and effectiveness in teams

The following information should be read by the team members to form the basis for 'Stage 2'

Levin (2005) talks about teams as dealing with three needs, which should be kept in balance for a team to work effectively;

- the needs or demands of the task in hand;
- the needs of the team to build up and uphold relationships within the team that will support the needs of the task;
- the needs of the individual, whose aims may encompass both short term and long term objectives, for example motivation and career development.

Lencioni (2002) comments that those who belong to unified, effective teams work in a culture which enables them to:

> "Trust one another. Engage in unfiltered conflict around ideas. Commit to decisions and plans of action. Hold one another accountable for delivering against those plans. Focus on the achievement of collective results."

Lencioni (2002) sees the above as a chain of activities supporting effective teamwork. He goes on to talk about the five dysfunctions of a team, namely if there is an 'absence of trust', this creates a situation where there is a 'fear of conflict' and individuals are wary of engaging in open discussion. This then leads to a 'lack of commitment' as when opinions cannot be shared openly individuals are reluctant to commit fully to decisions. The lack of commitment leads to 'avoidance of accountability' which in turn leads to an 'inattention to results' as team members put their own needs first.

When we think about conflict the most visible manifestations of conflict, such as arguments, spring to mind first. Conflict in teams however comes in many forms and some examples are given below.

- A dominant team-member causing disharmony by imposing their will on others.
- A team culture which denies individuals the opportunity to voice differing opinions.
- Fragmentation of the team into sub-groups, each with their own agenda.
- A team-member who does not pull their weight, or is inflexible.

Stage 2: Problems and solutions

Each member of the team should be given about two minutes to talk about a problem, that could lead to conflict within a team, that they have experienced, have observed, or are concerned may occur. The team member should also suggest how the problem could be avoided or overcome.

Decision-making

Stage 1: How decisions are made
To start the team discussion the following question should be asked, 'In carrying out the work on the exercises what processes have been used to make decisions?

The team's list should be compared with the following:

- By weighing up advantages and disadvantages;
- By thinking about previous similar decisions
- By considering what the outcomes of the decision might be
- By considering what resources will be needed
- By considering the context in which the decision is to be made.

Stage 2: The basis for decision-making
The following information should then be provided to the team
Analysing the 'How we make a decision' activity we can see that decision-making is generally based on:

- The context in which the decision has to be made
  The situation or the circumstances

- The criteria by which we will judge the outcome
  Criteria can be defined as something by which something is judged
  Criteria are based on requirements (what is needed) and constraints (limitations)

- The consequences that may result from making a particular decision
  The perceived advantages and disadvantages

The act of making any decision will have an effect on what future decisions can be made.

- Any decision may limit future options or may open the door to more possibilities.
- Any decision may impose constraints on the process being undertaken.
- Any decision will affect the level of risk or whether risk can be avoided.

Stage 3: Conclusions concerning the characteristics of the decision-making process
The team should be asked what their conclusions are concerning the process of decision-making, for example:

- Decision-making is a complex multi-faceted process which is underpinned by putting together proof or evidence to support the decision; the evidence is found through questioning;
- Any decision can change the direction of future activities or what future options are available.

(2) IS THIS GOOD REFLECTIVE PRACTICE?

Below are five brief passages which are offered as samples of reflective writing. In your group discuss how well each of them fits the concept of *reflective practice* and why, using the questions below to help you.

A We had the second meeting of our managing humanitarian aid group last week. We were given a short briefing and left to get on with it. We were asked to each produce a reflective report; this is it.

B The managing humanitarian aid module is all run through groups, with no teaching. We were given a problem and told to discuss it. Some of the others came up with childish ideas and I think that my marks will suffer if I have to be part of a group report. They all come from different subject areas so don't have the same background and intellectual capacity as me. This project doesn't count for an awful lot but the later ones do, so I can't let them get away with it. I will just have to sort the answer out myself and then tell the group what to do.

C We had our second group meeting last week and started our first project - it was very much a new experience for me. The problem that had been set was a very interesting one and some other members of the group came up with some aspects that I would never have thought of – the social and economic consequences of engineering decisions really are quite important. But it wasn't just about the problem scenario; we had to work out how to work together and to divide up the tasks. Looking back I think I was a bit too pushy; I had thought that taking the lead would earn me more credit but, on reflection, I can see that everyone has something to bring to the table and that I have other skills that weren't being exercised, like doing Google and Library searches. Next time I will try to take a step back and offer to do things rather than trying to tell others what to do.

D The first meeting of our managing humanitarian aid group was great fun and I enjoyed meeting lots of others in the same boat as me. It was fun to work with people from different backgrounds. From an Environmental Scientist, I picked up some good ideas about solving our first problem. I ought to be able to get them to do most of the background work, so that I can just input ideas [action point].

E I haven't done much group work before and it was *scary*! So many people that I hadn't met before and we aren't taught; we have to work it all out for ourselves. And, we are assessed on how we operate in the group. I'm afraid that I am going to do badly because I am really quite shy and don't like to speak up. There is even talk of peer assessment and I am sure that all the others will pick on me and give me zero.

Questions:

- Is their writing style appropriate to a professional learning diary?
- From this evidence, can you pick out one thing that each author has learned, and how that learning point was developed?
- Have they applied the process "describe – analyse – define action point" or is it purely descriptive? (Future sections should also discuss implementation of action points).
  - Does it demonstrate both willingness and capability to learn and improve their own performance, and their team's performance, based on self-evaluation?

Learning Styles

What do we mean by **Learning Styles?**

You will have the opportunity to find out more about your own learning style through a questionnaire on BlackBoard. 'Learning Styles' covers a range of different meanings and is not universally accepted as a concept. Much of the scepticism arises from the idea that each individual can be taught to match his or her own learning preferences, but this is clearly almost impossible to achieve. We are using the *memletics* questionnaire which covers two major and different aspects of learning. First there are questions that deal with how you prefer to process information – sometimes referred to as your 'learning mode'. Second are questions that deal with your own personal preferences for how you learn.

How do we use the Learning Styles Questionnaire?

The Memletics Learning Style Quiz (MLSQ) offers 70 statements, and requires you to choose whether the statement is "nothing like me", "partially like me" or "very much like me". Scores of 0, 1, and 2 are given, and you receives a score out of 20 in respect of each of seven Learning Style preferences: Visual, Aural, Verbal, Physical, Logical, Social, and Solitary. These are identified both by the type of input used, and the area of the brain that processes the input. **Visual** learners prefer to learn through pictures and images; developing spatial understanding. This uses the occipital and parietal lobes of the brain. **Aural** learning uses the temporal lobes, processing music and other sound. **Verbal** learning, through speech and writing, uses areas of the temporal and frontal lobes. **Physical** learning, processed in the cerebellum and motor cortex, uses body movement and the sense of touch. **Logical** learning uses logic, reasoning and systems, and is processed particularly in the left parietal lobe. **Social** learning involves working in groups or otherwise interacting with other people, while **solitary** learners prefer to work alone. Both social and solitary learning styles involve the limbic system and the frontal and temporal lobes (Davis, 2007). Because the questionnaire is used for research purposes as well as to provide feedback, you will not receive your scores immediately. These will be processed and you should receive an individual score sheet some days later.

When you receive your results you may wish to look through them and see if they correspond with your own view of yourself. There are no 'right' answers and each individual will have a different profile. Some of the answers might give you clues as to why you find certain parts of learning difficult: for example, if you are low on 'aural' then you may find lectures boring. In this context, if your preference is higher for 'solitary' than for 'social' then this may reflect how you approach learning in a group situation. You may wish to share your results with other members of your group: do you think that it is an advantage to have a variety of learning styles within your group? You may wish to record your thoughts on your own learning style profile (and those of the group as a whole) in your individual reflective log.

References
Davis S.E. (2007). Learning Styles and Memory. *Auburn University. Institute for Learning Styles Journal 2007: 1* 50
http://www.auburn.edu/~witteje/ilsri/Journal 20Volumes/Fall 2007 Vol 1 PDFs/Learning Styles and Memory.pdf

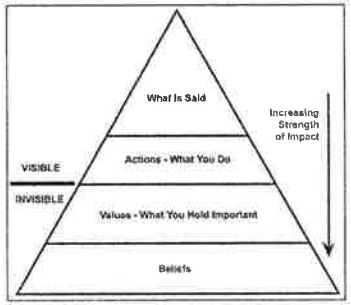
Diversity- Disciplinary and Cultural Differences

Q1) In your view, how diverse is your team? What differences have you detected in attitude, approach, experience or skills that you can attribute to differences in academic discipline, background or life experience (rather than simply personality?)

Professional teams are frequently diverse in age, experience, culture, gender and training.

"As the U.S. workforce is becoming more diverse with the increasing globalization and fierce market competition, companies are using work teams consisting of employees with diverse backgrounds, knowledge, and expertise to augment their competitive advantage by improving their internal operations. Although in theory, creating teams with diverse talents seems to be an effective human resources strategy (Cox & Blake, 1991; Devine, Clayton, Philips, Dunford, & Melner, 1999; Easely, 2001), in practice, the use of diverse teams creates unique challenges and often results in suboptimal performance. Although team diversity can potentially create a positive organizational synergy, the same idiosyncratic expertise and experience that leads to advantages can also engender significant difficulties resulting from coordination, tension, and intra/intergroup conflict (Jackson, May, & Whitney, 1995; Jehn, Chatwick, & Thatcher, 1997; Jehn, Northcraft, & Neale, 1999)."

"The Effects of Team Diversity on Team Outcomes: A Meta-Analytic Review of Team Demography" Sujin K. Horwitz and Irwin B. Horwitz, Journal of Management 2007; 33; 987



Q2) How have you applied the principles of equality, diversity and anti-discriminatory practice to your work in this unit? Have you or any team members changed your behaviour to accommodate the different perceptions, assumptions and approaches of different members of your team?

Have there been any circumstances where special sensitivity has been required? If native English speakers are working with students for whom English is a foreign language, how has the team supported them?

Different values and beliefs aren't always apparent – these are only visible indirectly through actions and speech. Your values and beliefs will have a strong impact on your assumptions and approach, but as they are invisible and have to be inferred, there is potential for misunderstandings.

To think about and reflect on:

How do you believe your academic training has influenced your own attitude and approach to problem solving? Are you aware of your own values, beliefs and principles and their impact on your words and actions?

How has differences between team members enriched your learning experience or your team's effectiveness in working on the different projects? What have you learned from observing the approach taken by other students?

Tackling sustainable development challenges often requires professionals from different disciplines to work together. Do you feel any better prepared now to work in an interdisciplinary team in your future professional career?

Team Roles

There are a number of very similar schemes for describing the roles that people take in successful groups. Perhaps the most well-known is that of Meredith Belbin (1996). There are psychometric tests that you can take that give an indication of your preferred role but the ones that you actually adopt can depend on the situation. The important point is that *all* of these are important to the successful functioning of a team – it's not just the ones who do all the talking.

	Team role	Strengths	Allowable weaknesses
Action oriented roles	**Shaper**	• Challenging, dynamic, thrives on pressure • The drive and courage to overcome obstacles	• Prone to provocation • Offends people's feelings
	Implementer (company worker)	• Disciplined, reliable, conservative and efficient • Turns ideas into practical actions	• Somewhat inflexible • Slow to respond to new possibilities
	Completer finisher	• Painstaking, conscientious, anxious • Searches out errors and omissions • Delivers on time	• Inclined to worry unduly • Reluctant to delegate
People oriented roles	**Co-ordinator** (Chairman)	• Mature, confident, a good chairperson • Clarifies goals, promotes decision-making, delegates well	• Can often be seen as manipulative • Offloads personal work
	Teamworker	• Co-operative, mild, perceptive and diplomatic • Listens, builds, averts friction	• Indecisive in crunch situations
	Resource investigator	• Extrovert, enthusiastic, communicative • Explores opportunities • Develops contacts	• Over-optimistic • Loses interest once initial enthusiasm has passed
Cerebral roles	**Plant**	• Creative, imaginative, unorthodox • Solves difficult problems	• Ignores incidentals • Too preoccupied to communicate effectively
	Monitor evaluator	• Sober, strategic and discerning • Sees all options • Judges accurately	• Lacks drive and ability to inspire others
	Specialist	• Single-minded, self-starting, dedicated • Provides knowledge and skills in rare supply	• Contributes only on a narrow front • Dwells on technicalities

[University of Cambridge, Institute for Manufacturing]

Discussion points:

3. Look through these descriptions on your own: which of them correspond most closely with your own preference (you may have more than one); which is least like you?
4. As a group, look at the collection of preferences: are there roles that are missing, roles that are over-abundant? Are there roles that you have failed to recognize?
5. How will this discussion influence the way that you work as a team?

Belbin, R. Meredith (1996), Team roles at work, Butterworth Heinemann, Oxford
Belbin, R. Meredith (2003), Management teams: why they succeed or fail, 2nd Ed, Butterworth Heinemann, Oxford

Information Literacy

Information Literacy - learning to search for, evaluate and share information

In each project, you will need to search for, evaluate, share and apply information thoughtfully, methodically and accurately. This forms a key component of both your project report assessment and your individual reflective report.

1) In turn, read out each of the ten statements below and as a group discuss whether each is correct, using your past experience of information searching skills.

a) National newspapers are never wrong or biased in their reporting of information.
b) Wikipedia is a great place to find information quickly.
c) I know I can trust anything published on an official company website.
d) Cutting and pasting a few sentences is fine, and probably no-one will notice.
e) The best way to share my findings is just to print everything out in full.
f) Finding peer-reviewed journal articles is difficult and not worth the hassle.
h) Old data from a peer-reviewed journal is better than new information in a company report.
i) Referencing style isn't important, as long as we are consistent.
j) No-one is available to help me learn how to reference and find information more efficiently.

2) Then, having scanned through the information literacy guidance on the following pages, attempt as a group to comment on each point more fully - did your views change?

Researching your Project - The Common Question

To help you learn how to critically appraise information, in each project you will research a "common question" you have chosen as central to the project, which everyone in the team investigates in addition to your individual questions.

In class, you will then discuss the differences and similarities in what each of you have found. It will be more interesting for your team if when researching the common question, you can find some original material that no-one else in your team has discovered, rather than everyone bringing along and sharing identical findings.

To assist you in this, the form on the attached page will help you critically evaluate, record and share the information that you have found.

Peer Reviewed Sources of Information

In academic and professional work, you will be expected to cite reliable data. Reputable academic journals only publish papers that are *"peer reviewed"*. This means their content has been rigorously checked by a panel of experts in the field before being published. If judged to be below the required standard for any reason, academic journal submissions are rejected or returned for revision by the author. Several attempts before a paper is accepted is normal.

In contrast, other sources of data such as the news media, trade journals, company websites, Wikipedia, reports from charity organisations or pressure groups, books, personal blogs, etc have little or no quality control and may be incorrect, incomplete, outdated, biased, or be accidentally or deliberately misleading, so YOU will need to critically evaluate them yourself.

These data sources may offer vital different perspectives and provide more recent data, but should be used with caution, and you may lose marks for using them as a reference or relying on their data in your work without assessing their credibility and stating this in your preport.

You will be awarded far more marks for your work if you locate information in a peer-reviewed journal, or can trace the *original source* of information subsequently reported in the media or on other websites. "GOOGLE SCHOLAR" search engine or "WWW.INTUTE.AC.UK" are excellent starting

points, or you can use the library's databases and electronic journals. The University's librarians are available to help you improve your information searching skills.

FAQ Information Searching - ***Some advice from Martin Snelling, John Rylands Library***

1) Finding information – where's the best place to start?

- There probably isn't a definitive source
- Synthesise information from many sources
- Don't restrict yourself just to Google or Wikipedia
- Try to find reliable, trustworthy sources
  - Look for peer-reviewed & published documents
- Choose sensible search terms
  - topics, keywords, authors, organisations, dates, etc
- Don't ignore library resources! Try "Searchit" on Library homepage.

Recommended Search Engines:

- *GOOGLE SCHOLAR http://scholar.google.co.uk/*
- *INTUTE http://www.intute.ac.uk/ (Academic search engine)*
- *SEARCHIT http://www.library.manchester.ac.uk/ Find link to "SEARCHIT" from University of Manchester Library Homepage (University Login required).*

2) How can I Avoid Plagiarism?

- Be aware that UoM uses "Turnitin" software to find incidences of plagiarism!!!.
- NEVER CUT AND PASTE!
- Use " " for ALL direct quotes
- Plan ahead so that you don't run out of time
- Record details of all sources you want to use
- Make sure you take notes properly
- Get advice, Reference correctly
  - See www.humanities.manchester.ac.uk/studyskills/essentials/writing/avoiding_plagiarism.html
  - Try https://connect.le.ac.uk/p45202934/

3) What's wrong with relying on Google searches?

- No quality control
- Inappropriate material
- Results will be unstructured
- Much duplication
- Bias
- Not as good as Google Scholar
- Plenty of quality-assured web resources

4) What's wrong with relying on data from Wikipedia?

- Your work will be penalised for using Wikipedia pages as a reference
- No quality control
- Bias
- Vague, unstructured
- Low level information
- Padding
- Inaccurate in many cases
- But! Lists of links/references can be useful starting point

Contributing to a Team

Much of this course unit is concerned with performing together as a team. Teamwork is vital in managing projects but it should be more than the sum of the individual efforts (sometimes it can be less than the sum of individual efforts because people pull in different directions).

Think of teams or groups of which you have been a member – for example: sports teams, musical groups, school and college societies or family or religious groups. Try writing some of them down.

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Now think through those teams or groups. What roles (eg striker/defender; violin/piano player; treasurer/secretary) did you play? How did these fit in with other members of the group?

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Discussion points:

1. Looking at the groups and roles that you have described, can you see ways in which different people contributed different skills?
2. As a group, share your experiences of teamwork and see if you can identify similarities and differences in your experiences.

- What resources will be needed?
- What obstacles will there be?
- What might go wrong?

Remember, you may have to go back to the problem definition or solution finding again.

4. The problem of defining and developing creativity

There is no one definition of creativity: creativity is also often perceived as providing an outcome that is imaginative, innovative, original, valuable or interesting. Many now agree that a broader definition should be used, for example, the outcome of a problem-solving process can be considered creative if an incremental change enhances the value of an existing solution.

"Creativity… consists largely of re-arranging what we know in order to find out what we do not know." (Kneller: 1967)
"I … associate creativity with achievement. If a person is doing something that, at least in intent if not in realization, will contribute to society, he or she is being creative." (Balkin: 1990)

Creative individuals are considered to have:

- independence of thought or action;
- ability for lateral and divergent thinking;
- ability to see many viewpoints;
- ability to tackle a problem from a different angle;
- ability to rethink situations or problems and reassess assumptions and opinions;
- ability to discover new meanings through analysis.

Examples of creative thinking in developing responses to the exercises
Try to identify examples of creative thinking in the work for this unit and discuss how problem solving and creative thinking abilities could be developed further.

References

Balkin, A. (1990) What Is Creativity? What Is It Not? Music Editors Journal, Vol. 76, No. 9, Special Focus: Creative Thinking in Music, pp. 29-32.
Blackett PMS (1962) Studies of War. Oliver and Boyd
Buzan A (1996) The Mind Map Book. Putnam
Checkland PB (1981) Systems Thinking, Systems Practice. Wiley
Kneller, G. (1967) The Art and Science of Creativity. Holt, Rhinehart and Winston
Mitchell WF & Kowalik TF (1989) Creative Problem Solving. Available online at http://www.qub.ac.uk/directorates/sgc/learning/Resources/Managingstress/Filetoupload,119297,en.pdf
Tomkinson C B (1972) 'The Application of Operational Research to Highways', PTRC Conference on the Marshall Report, London 1972

5) How do I get access to Electronic Journals online?

- At UoM you can see 44000+ e-journals for free!
- Accessible from library catalogue and library homepage
- Some need special passwords for access
  - See: http://www.library.manchester.ac.uk/texts/pass/ejournals/
- Available off-campus (username/password)
- The PDF versions have bibliographic details – HTML versions might not

6) Which Databases can I use at the University of Manchester?

- Use links from the UoM library homepage
- Subject-specific or General
- Try several – just to be thorough
- Ask for help in library if you don't find much
- Some need special passwords for access
  - See: http://www.library.manchester.ac.uk/texts/pass/databases/
- Can also be used off-campus
- Can download results into "Endnote" to manage references

7) How do I do Referencing?

- Decide which system to use
  - Harvard, Scientific, etc (NB, MBS Prefers Harvard)
- Be consistent
- Needs attention to detail!
- You could use Endnote/Endnote for Web to manage references
- Lots of help/advice is available from your Faculty librarian.
- For the comprehensive MBS referencing guide, see: http://www.library.manchester.ac.uk/subjects/humanities/mbs/business/training/_files2/fileuploadmax10mb,166212,en.pdf

8) How can I check if websites are appropriate / valid to refer to?

Suggested Criteria for Analysis Include:

- Authority - Who wrote it? What are their credentials? Are there any contact details provided? Can you check them?
- Currency - Is it recent? When was it last updated?
- Objectivity/Purpose - Is it biased? Why was it written? Is it deliberately or accidentally misleading?
- Credibility/Accuracy - Are there errors? Is it reliable? Who has reviewed or screened it? Is it consistent? Can the content be verified? Is it copied from elsewhere? Could it be a hoax?
- Coverage - Is it complete/comprehensive? Is the information in depth or superficial? Are there references or further links?

Useful Website Links for evaluating website information:

- *http://www.vts.intute.ac.uk/detective/* **(free online tutorial)**
- *http://www.library.jhu.edu/researchhelp/general/evaluating/*
- *http://www.lib.vt.edu/help/instruct/evaluate/evaluating.html*
- *http://www.virtualsalt.com/evalu8it.htm*

Common Question - Critical Analysis of Information Sources

1) Website / Document / Book Reference (how you would write the reference to this information in your report's reference list).

2) How Was This Discovered? (Search engine/database? Keywords used? Link from which site?)

3) Summary of Information Found (Up to 5 bullet points):

-
-
-
-
-

4) Evidence of Authority (Credentials of the author / organisation / publisher? Contact details?):

5) Evidence of Credibility (Accuracy? Errors? Consistency? Completeness? Citations? Reviews?):

6) Evidence of Objectivity (Is the content biased? Does the source have a clear purpose?):

7) Evidence of Currency (Is the content recent and clearly dated? Up to date? Broken links?):

8) Thinking back, how did your own preconceptions, assumptions, educational discipline and cultural background influence your information search?

Creativity and Problem Solving

1. Defining the Problem

'Finding the problem is half the answer.' (Tomkinson: 1972)
During the Second World War the British found that their aeroplanes were not very successful at sinking submarines. A team of RAF officers soon recognised the problem – by the time that the aeroplane was overhead where the submarine had been it had submerged. The answer was simple – set the depth charges to go off deeper. But this failed to work – the answer was that the charges were still not set deep enough. But that didn't work either. The problem was passed to a group of scientists who came up with a successful answer – set the charges to go off at a much shallower depth. Why? Because an aircraft crew could only successfully identify where the submarine had been if it had only just submerged – if it had had chance to submerge to a greater depth then the crew were very uncertain of its previous position (Blackett: 1962) So, creativity is needed in identifying the problem as well as the answer. Just as physicians need to diagnose a medical condition before they can treat it, so we need to diagnose a problem before we can tackle it.

2. 'Wicked' problems

Horst Rittel and Melvin Webber (1973) identified a class of problems that were not amenable to conventional problem solving; they called these 'wicked' problems, which:

- Have no definitive formulation;
- Have no clear end, no 'stopping rule';
- Have an answer that is 'good or bad' rather than 'right or wrong';
- Have no immediate or ultimate test of their resolution;
- Have consequences to every solution, there is no possibility of learning by 'trial and error';
- Do not have a well-described set of potential solutions;
- Are essentially unique;
- Can be a symptom of another problem;
- Have causes with no unique explanation;
- Bring expectations that their 'owners' will find the 'right' answer.

Not all of these have to be present for a problem to be *wicked*, but complex global issues, of eg humanitarian aid or sustainability, demonstrate many of them.

3. Approaching the problem

The first step in tackling a problem scenario is to try to think through all the connections and all the problem possibilities – some people like to do this diagrammatically, using 'rich pictures' (Checkland: 1981), 'mind maps' or spider diagrams. Brainstorming techniques may also be used derive more thoughts about the problem – in this technique a series of ideas is generated without any thought as to how sensible they are, the sifting of ideas is done later. Bill Mitchell and Tom Kowalik (1989) advocate generating as much data about the problem as possible – who is involved; what is involved; what happens? Then they suggest sorting out the most significant facts before trying to identify what is the real problem.
Having identified what might be the nub of the problem the same process has to be repeated with possible solutions and sometimes this will lead back to considering the problem again and redefining it. Remember, wicked problems have no definitive formulation.

Having identified possible answers then it is important to sort out which ones to follow. Mitchell and Kowalik suggest a series of questions to ask about the acceptability of a solution, such as:

- Who will it affect?
- How might I gain their acceptance?