Research Methods and E-Learning

Introductory Workshop
October 2012
Kevin Gaughan

Class Wiki: http://ditmeloct2012.pbworks.com

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The Process and the Timeline

Research Methods -> Dissertation

• Research Methods is a 5 ECTS support module to the dissertation covering general research methods and report writing. It is offered on a blended learning basis to culminate in the submission of your research proposal in February 2013. It is a necessary pre-requisite to undertaking a dissertation.

• The Dissertation is a 25 ECTS component based on carrying out a project on your chosen topic for submission in September 2013.
Module Descriptors

Research Methods and E-Learning
This module covers general research methods, presentation skills and report writing. The focus is on developing the necessary techniques for the successful identification of materials relevant to the research process, and thereby to introduce students to undertaking supervised research at level 9 NFQ. It is designed to support the dissertation.

Dissertation
This module must be read in conjunction with the module on Research Methodologies and E-Learning. The dissertation is considered an essential element of the programme and is intended to provide the learner with the opportunity to select an area of related topic and use this to integrate the learning of the programme as a whole. In addition other aspects not specifically addressed in the programme modules may also be explored.

The dissertation proposal which has been developed in the Research Methodologies and E-Learning module will be executed in this module. The focus is on implementing the necessary techniques for the successful identification of materials relevant to the research process and to undertaking supervised research to an acceptable academic standard.

Timeline of Events

- **Tuesday 30 October 2012**: First Workshop – Introduction and Kickoff.
- **Monday 5th November 2012**: All Students must go to this web page and apply for access to the class wiki:  
  http://ditmeloct2012.pbworks.com
  
  **NB**: If your name is not obvious from your email address then add a message which lets me know who you are.
- **Monday 12th November** : Deadline for students to have created their own wiki page under the class wiki. This folder is to be used as a co-operative weblog of your proposal development process.
- **Monday 19th November 5PM - 7PM**: Room TBA Second Workshop – Information Literacy with Julie de Foubert
- **Wednesday 5th December**: Final Workshop – Peer Presentations - All students are expected to informally present their proposal ideas in a series of group workshops.
- **Friday 7th December** : Deadline for Submission of Preliminary Research Proposal
- **Friday 22nd Feb 2013** – Deadline for submission of final Research Proposal (including literature review)
- **March – June 2013**: Formal supervised work on the Dissertation
- **July / August**: Independent Research + Write Up
- **Mid September 2011 (date TBA)**: Final Submission of dissertation to be followed by presentations and interviews.
The Dissertation

Dissertation – Learning Outcomes

**Learning Outcomes:** On completion of this module, the learner will be able to:

1. execute a research proposal for a minor dissertation and complete the project by application of appropriate time management strategies.
2. assess and evaluate library resources applicable to their research.
3. construct a strategy to conduct research relevant to the dissertation.
4. complete a minor dissertation on an energy management focused topic.
5. write a technical report and present the results of a project to a peer group.
6. realise the objectives set out in a minor dissertation.
Dissertation - Assessment

Module Assessment:

<table>
<thead>
<tr>
<th>Research</th>
<th>20%</th>
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<tbody>
<tr>
<td>Scope of literature review</td>
<td></td>
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<tr>
<td>Analysis of state-of-art</td>
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<tr>
<td>Relevance to the project</td>
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<table>
<thead>
<tr>
<th>Methodologies</th>
<th>15%</th>
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<tbody>
<tr>
<td>Arealisation to the problem under investigation. Includes implementation, experimental design or the analytical approach for survey type projects</td>
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<table>
<thead>
<tr>
<th>Analysis</th>
<th>15%</th>
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<tbody>
<tr>
<td>Analysis of Methodologies and Outcomes</td>
<td></td>
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<tr>
<td>Conclusions &amp; Recommendations</td>
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<table>
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<tr>
<th>Realisation of Objectives</th>
<th>25%</th>
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<tr>
<th>Time Management</th>
<th>10%</th>
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<tr>
<th>Presentation of Dissertation</th>
<th>15%</th>
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<tbody>
<tr>
<td>Clarity of written expression,</td>
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<td>Referencing, data representation</td>
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Research Methods and E-Learning
Research Methods LOs

<table>
<thead>
<tr>
<th>Learning Outcomes:</th>
<th>On completion of this module, the learner will be able to:</th>
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<tbody>
<tr>
<td>1.</td>
<td>Appraise and evaluate library resources applicable to their research at level 9 NFQ.</td>
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<tr>
<td>2.</td>
<td>Construct a strategy to conduct research relevant to energy management.</td>
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<td>3.</td>
<td>Formulate a study and research plan for the dissertation.</td>
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<td>4.</td>
<td>Estimate their own characteristics as a learner, and their particular learning style, relative to others.</td>
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<tr>
<td>5.</td>
<td>Evaluate online data bases and sources of information relevant to energy management.</td>
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<tr>
<td>6.</td>
<td>Access on-line journals and databases.</td>
</tr>
<tr>
<td>7.</td>
<td>Use virtual classroom learning media.</td>
</tr>
<tr>
<td>8.</td>
<td>Write a research proposal for a dissertation and develop a plan to complete the project by application of appropriate time management strategies.</td>
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<tr>
<td>9.</td>
<td>Demonstrate the ability to write a technical report and present the results/conclusions of a project to a peer group.</td>
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Blended Learning

• Research Methods will be offered using a blended learning approach involving:
  – Workshops
  – Online Learning Resources
  – A Collaborative Web Blog (Wiki)
  – Self Directed Study
  – Tutor Support
Research Methods: Module Content

1. Library resources and on-line databases
2. Development of research strategy
3. Dissertation research structure and presentation skills
4. Learning techniques (e.g. Active learning, reflective learning, surface and deep learning and problem based learning)
5. Basic research and study skills including bibliographic and computing skills
6. Identification of library resources and secondary sources
7. Procedures for research evaluation of research
8. Referencing, plagiarism
9. Developing and refining the dissertation proposal
10. Research management including time management, planning and organising research
11. Writing up and completing the project;
12. Communicating the results

Four Key Areas

• Learning Techniques
• Information Literacy
• Research Management (including planning and organisation)
• Technical Writing
Research Methods - Assessment

Module Assessment

<table>
<thead>
<tr>
<th>Proposal &amp; Problem Statement</th>
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<tbody>
<tr>
<td>• Originality and Relevance</td>
<td>15%</td>
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<tr>
<td>• Framing of the Research Question</td>
<td>20%</td>
</tr>
<tr>
<td>• Selecting and refining the project proposal</td>
<td>20%</td>
</tr>
<tr>
<td>• Research and presentation of proposal</td>
<td>20%</td>
</tr>
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</table>

| Participation in online communication sessions, both in terms of original contributions and replies to fellow-students. | 25% |

Research Proposal: 75%
Participation: 25%

Participation

- Participation will be judged by
  - Quality of contributions to class wiki
  - Participation in group workshops

Note: This process will involve class review of your ideas and your project proposal. If your proposal involves issues of commercial confidence then inform your class tutor so that an alternative approach can be used in your case.
The wiki

Introduction to the MSc wiki

A wiki is:
“… a page or collection of Web pages designed to enable anyone who accesses it to contribute or modify content”

“… the simplest online database that could possibly work”

named after a Hawaiian word meaning “fast”


*It should be noted that Wikipedia is not generally regarded as trustworthy enough for the purposes of academic referencing but in this case I think its use is entirely appropriate!
The research wiki will …

• Be used as the main co-ordination tool for the delivery of the Research Methods Module.
• Be used as the repository for course materials and links to learning resources
• Be used as a collaborative learning tool by the class
• Be used to record and to monitor your progress in developing a research proposal
• Be used in any other ways that you feel will support the learning process.

• Be taken into consideration for assessment of the module.

What does all this mean

• As tutor I will use the wiki as a repository of learning resources to support the module, as a means of communication with learners and as a means of monitoring and guiding learners.

• Every student is required to register at pbwiki.com and to apply for access to the wiki called http://ditmeloc2012.pbworks.com

• You will be given read and write access to the wiki. This will give you the ability to create pages and folders, to upload new content and to edit existing content.
• You are required to create your own page on the wiki (using a clearly identifiable name)
• You are encouraged to use your page to document the development of your research proposal.
• You are encouraged to use the wiki facilities to collaborate with your tutor and your classmates.

• I will leave the wiki in place as you progress through your project. You may continue to use it as you see fit to support your dissertation. Alternatively you could decide to create your own wiki specifically for your project.
Editorial Policy

• Every student will have full read and write access to all parts of the wiki. This includes the ability to edit pages created by your class mates and pages created by your tutor.

• As administrator I can see all edits, see who made them and if necessary reverse them but I intend to exercise a loose editorial policy and see how the wiki develops. If important stuff gets deleted by accident then I can undo that delete on request. If you are really worried about other people deleting your stuff you can always create your own private wiki that only you can edit and link to it from the sidebar of this wiki.

• As a matter of etiquette – rather than edit another students page directly it is probably more polite to use the comments feature.

Here are some ways that you might use the wiki

• To access the learning resources for the module.
• To create an online diary (a blog) of your progress towards your research dissertation
• To create links and upload content that may be useful to yourself and your classmates
• To communicate with your fellows and to assist them in their own learning.
• To work in small groups to facilitate learning
• As a kind of chat room
• In any other manner you can think of that facilitates the learning process.
Notifications

- A feature of pbworks is that you will receive an email notification any time someone makes a change.
- To reduce notification spam you may find it useful to change the notification frequency to once per day. This can be found under the preferences section of “My PBworks Home”.

Your Project Proposal
The Project Proposal

• The project proposal is the main deliverable from this module and carries 75% of the marks.
• The project proposal is a vital stepping stone to your project and dissertation
• The preliminary project proposal is used to start the allocation of project advisors and must be submitted via the wiki on or before Friday 9th December.
• The final Project proposal should be submitted via web courses (turn it in anti-plagiarism tool) on or before Friday 24th February 2011.
• The final project proposal is maximum of 4,000 Words / 20 pages.

Preliminary Project Proposal

• Name of Student and Title of Project

• Identification of Preliminary Research Question

• Outline of Methodology

Recommended length: 1 page
Criteria for Final Project Proposal

- See more detailed list of criteria on wiki
- Required Sections:
  - Title Page: Name of Student and Title of Project
  - Abstract (200 Words maximum)
  - Introduction – Identifying the Area of Research and Justifying the Proposed Study
  - Preliminary Literature Review
  - Identification of Research Question
  - Proposed Methodology
  - Expected Challenges
  - Identification of the resources required and how these will be provided.
  - Project Plan indicating main phases, main deliverables and timeline (Gannt Chart)
  - Ethical Assessment of Proposed Research Project

What does a Dissertation Look Like?
Dissertation Guidelines

• Typically 15,000 - 20,000 Words (60 – 90 pages)
• Typical Structure:
  – Title Page
  – Acknowledgements (optional)
  – Project Brief
  – Abstract/Summary (<200 words)
  – Index
  – Main Text
  – References
  – Appendices (alphabetically designated)
  – Design Material (optional)

What is in the Main Text?

• The Main text depends on the type of project but I would generally expect to see
  – Introduction
  – Lit Review
  – Chapters on Methodology
  – Chapters on Analysis of Results
  – Conclusion
What are the objectives of a dissertation

- “To critically inform a technical reader about the topic and establish a rationale for the approach adopted and choices made
  To demonstrate competence in the processes of problem-solving, technical analysis, design and test
  To provide appropriate information to allow a reader to understand the basic problem and its significance and to make an assessment of the relevance, value, viability and potential of the work which has been undertaken.” (Dr. Brendan O’ Sullivan DIT)

- In my view a good dissertation should contain all of the following elements:
  - Literature Review
  - Description of Original Work
  - Appropriate Analysis of the Outcomes

Choosing a Dissertation Topic
Advice on Choosing A Topic

- Choose an area that interests you and is relevant to Energy Management.
- Research that area to determine what is already known about that area and what questions remain to be answered. What type of research are others doing in this field?
- If at all possible try to talk to experts in the field you are interested in. This may include members of DIT staff, an outside academic or an industry expert. Someone who is currently working in a field will almost certainly know what the important issues are.
- Boil your thinking into one or more research questions about the topic. Answering these research questions will be the core of your project.
- Test and refine your research questions in consultation with experts and your peers. Make sure that your questions are clear and unambiguous*. Think about how you will answer them and about the time, the resources and the facilities that will be required. Revise your questions if necessary.

*It should be noted that a lot of the world’s greatest research comes from the study of open ended or ambiguous questions. “I wonder what would happen if ….” For he ill how we to cail yout open bed a trivision unk in the plh of your field to go all the way. The discr unambiguos questions are nece for the development of new ideas and the creation of a better world. However, good ideas are not always the best ones.

What are our expectations

- Does it have to be “novel”
  - No. Naturally we would love if you come up with something new but it should be remembered that a taught Masters is an apprenticeship in research. Compare 3 months for MSc dissertation versus 4 years for a PhD. We do however expect you to be conversant with the state of the art in your chosen field.
- Does it have to contain original work.
  - Yes. The thesis must be your own work and must contain a significant element that you have done yourself. For example a description of a companies energy management system would not be sufficient but an analysis done by you that benchmarks that companies energy management system against those in similar companies may be.
Examples

- Energy Management is a broad field and a wide range of projects are possible ranging from solidly technical to more business focussed projects. Here are some examples to give you an idea of the breadth of topics that might be covered:
  - A study of the potential for geothermal energy in Ireland
    Question: What is the technical and economic potential for Geothermal Energy in Ireland?
  - To develop a new controller which optimizes the output power of a photovoltaic cell
    Question: “Is it possible to implement this and what efficiency improvement can be gained by using this new control method?”
  - A comparative study of energy management systems in a number of third level colleges.
    Question: “What different approaches are being used and how do they perform relative to one another?”
  - To develop a software program which helps residential customers to minimize their expenditure on energy
    “Is it possible to develop this program and what savings can it typically deliver?”
  - A detailed market study of the Irish wood pellet market
    “What is the current and projected market situation in terms of demand and supply?”
  - To produce a business plan for a start-up energy services company
    “What is the market? What is the opportunity? What are the funding requirements?”
  - An energy efficient lighting project.
    “What is the current state of the art in this field?” “What is the most appropriate strategy for this site?” “What lessons can be learned from this implementation?”

The all Important Research Question

- Past experience has shown us that a great research question leads to a great dissertation. A great research question is interesting and relevant as well as being suitably challenging. It is clear and unambiguous and easy to express. Most of all it is answerable given the time and resource constraints that the student operates under.
Can I change my mind?

- Ideally a student will develop the germ of an idea for the preliminary research proposal, develop it further for the full research proposal and go on to produce a great dissertation on that topic.
- Sometimes it doesn’t work that way and students find they have gone up a blind alley. In this case we do allow students to change.

A Note about Work based Projects

- Energy management is an applied discipline. Work based projects are highly encouraged but there are some important issues to consider.
- In my experience it is important realise that the academic requirements of your dissertation may be separate from the business requirements. You could do a great job of getting something working but if you fail to write it up correctly and do a good literature review you will still get a poor mark for the dissertation. On the other hand you could do a fabulous study and analysis but still miss an important business deadline.
- I think that having clear research questions helps decouple the business requirements from the academic requirements.
A note about Project Advisors

Project Advisors

- Every project will be allocated an advisor who is a member of DIT staff. If you have already contacted a member of DIT staff during the course of preparing your proposal who has agreed to supervise your project then please indicate this on your project proposal.

- The role of a project advisor is quite different from the role of a project supervisor that you may be familiar with from undergraduate projects. This is your project proposal and you are the project manager responsible for delivering a successful dissertation. Your advisor will not direct the project. Their main function is to advise on the academic requirements of an MSc dissertation and to observe your progress. They will be a key member of the assessment panel.
The Purpose of Research

The purpose of research is to advance knowledge in some manner. This means that the research that you undertake has to be:

1. Embedded in a recognisable field of study, taking account of, and drawing on, past research;
2. Of interest to other researchers working in the same field, and possibly to the wider community;
3. Can be generalised to more than one individual experience or circumstance.
Research questions
• An important way of ensuring that research is well-focused and purposeful, is to ensure that it provides clear, unambiguous, (and hopefully informative), answers to particular questions.
• These are called your Research Questions, and can either be answered via the Literature Review (in which case the answers will have already been discovered by others, but will be novel to you), OR via the practical work that you undertake, in which case you could well provide novel and original answers.

Examples of Different Research Questions
Preliminary Questions intended to be answered by the Literature Review:
– What are the available technologies for creating a database-driven website for use in furniture retail?
– Which currently existing e-commerce websites for furniture retailers demonstrate examples of best practice?
Focused Questions to be answered by the Practical Research:
– Can commercially available web development tools be used to create an effective and professional-looking e-Commerce website for a furniture retailer?
– What are the most important aspects of a furniture retail e-Commerce website from the customer point of view?
The process of research is well-documented. This diagram more or less describes the activities you need to undertake.

What we will do in this discussion, is to look at some of the elements, and how they fit together.

### Research possibilities

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<thead>
<tr>
<th></th>
<th>Qualitative</th>
<th>Quantitative</th>
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<tbody>
<tr>
<td>Experiment</td>
<td>Field-testing</td>
<td>Bench-testing and simulations</td>
</tr>
<tr>
<td>Survey</td>
<td>Unstructured interviews</td>
<td>Written questionnaires</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Using expert judges</td>
<td>Evaluation criteria and checklists.</td>
</tr>
<tr>
<td>Observation</td>
<td>Participant observation</td>
<td>Observation schedules</td>
</tr>
</tbody>
</table>
Other forms of research

**Historical & Documentary Research** proceeds by scrutinising existing materials, using them as sources of evidence.

**Action Research** is normally conducted in an educational or political context. Action is taken, monitored, evaluated and then modified for the next cycle.

**Ethnographic Research** consists of an in-depth study of a cultural phenomenon, in order to generate new theory.

**Case Study Research** selects a whole range of research methods in scrutinising one particular context or situation.