A Research-Oriented Term Paper (as presented in Chapter II-6 of the Volume 2 of the Curriculum Guidelines & Resources)

In this chapter, we focus on a research-oriented final paper. To distinguish this from the previous chapters and to clarify the differences, we refer to this version of the final paper as a "term paper." We document one specimen research term paper assignment on a project management topic, including the required learning outcomes, sample project idea, research methods details and possible grading rubrics, alongside general guidance regarding research projects and dissertations.

Objectives and Organization of the Term Paper

Objectives

The research term paper builds on the foundations of research and enables students to develop to completion an agreed individual research investigation. The topic of investigation can be negotiated at the outset with the instructor or can be given to students, but it is important to ensure that the scope of the investigation is feasible within the time available. The assignment will give students a chance to consolidate the knowledge and skills acquired, including research-related aspects, whilst enabling them to explore a specific area and bring a substantial and demanding piece of work to a successful completion. Guidance on marking criteria will be provided at the end of this chapter.

The overall objectives are:

- To gain an understanding of the research process and methods
- To obtain a deeper engagement and familiarity with the specific topic under investigation.

The detailed Learning Outcomes can be split into two groupings to cover the above objectives:

Research related learning outcomes:

The student should be able to:

1. Understand the different research approaches--quantitative, qualitative, and mixed methods.
2. Describe the different research methods including experiment, survey, case study, action research, narrative, grounded theory and ethnography.
3. Understand the different data collection methods, including sampling, secondary data (documentation, survey, and multiple sources), observation, questionnaire an interview.

4. Select appropriate research methods for a given project
5. Reflect on and evaluate the processes and resources used to carry out the investigation, giving clear evidence of independent thought
6. Structure a report in a scientific manner
7. Present data and findings in a clear manner, and cite and list references appropriately
8. Work (individually/in a group) to complete an investigation

Topic Related Learning Outcomes

These are typically evidenced through showing that the research is applied in context. The student should be able to:

1. Learn more about the specific topic under investigation (e.g. Agile Project Failures)
2. Consolidate knowledge relevant to your research paper
3. Articulate and apply relevant concepts showing insights and awareness of complexities in the problem domain
4. Explicitly analyze a problem or concern
5. Properly use evidence, such as journal papers, to support argument and use up to date information and relevant sources
6. Show that research undertaken is relevant and properly sourced
7. Evaluate available information within your context
8. Summarize key issues and outcomes

What is a term paper?

A research-oriented term paper is a substantial piece of independent study leading to a formal written report. It presents students with an opportunity to specialize in a particular context or domain, to research a specific problem or question, and to provide a platform for integrating many aspects of PM that are covered in different parts of the course. It is also an important mechanism that allows the students to practice and develop key skills as both a learner and a researcher, thereby allowing students to demonstrate their *graduatedness* capacity, as well as the abilities in analysis, synthesis, evaluation, communication, problem solving and creativity.

Term papers enable student to work either individually or in small groups to explore the boundaries of a topic and to evidence their ability to manage time and carry out research. Given that the research paper involves a non-trivial task, it is not uncommon for this to be exploitable by students in job interviews and requests for references. Performance in research tasks often provides a reliable guide to the potential of students to complete tasks and assignments, to communicate and to solve problems.

Content, Structure and Format

The length of the document should be appropriate (we suggest around 12-15 pages, plus appendices for data). This allows students to focus on clear communication of the relevant details and emphasizes the presentation of the relevant aspects, which are crucial skills for project managers.

The primary purpose of the term paper is to report and inform regarding relevant research and its primary audience is other project management students and examiners. In consequence, the design goals to aim for are: **continuity** – that the material is ordered both to demonstrate the development of the student's work and to develop the reader's understanding; and **completeness** – that the student is able to give as full account of their work as is necessary and, especially, that nothing of significance is left out. Put simply, the report must tell a story – a full story and an interesting one.

Unlike an essay, a report contains headings and subheadings that support the storyline. Each subheading may be further divided into subsections or subdivisions. Each section and subsection is numbered and relates to the 'design' of the story.

To develop and improve the continuity of the report, it will be necessary for students to pay attention to the *fine*-structure of the document, i.e., to how the individual chapters within the main body of the report are designed. If these are thought out beforehand, in outline or even just as sub-headings, then at least the student will know where they are going as they write. For each sub-section in the outline plan, students should try to begin with general idea (or broad picture) and then develop their argument (or focus) towards the more detailed points or areas they want to consider. This follows the maxim "Move from the general to the particular," which is also useful when the student finally comes to write the paragraphs.

The Main Sections

The physical layout and formatting of the report is important and, yet, they are very often neglected. A tidy, well laid-out, and consistently formatted, document makes for easier reading and is suggestive of a careful and professional attitude towards its preparation. Each research project and the resulting report is unique; however they share a particular structure and sequence and should attempt to include as many of the following aspects as possible, see Table II-4-1.

Table II-6-1: Sample Topics to be included in the Term Paper

Suggested Final Project Topics
Title Front Page Abstract Key Words Acknowledgement Table of Contents (List of Figures—optional) (List of Tables—optional) (List of Abbreviations—optional) Content • Introduction • Literature review • Research Design/Methodology • Results/Findings • Evaluation • Summary and Conclusions References (Bibliography —optional) (Appendices—if needed) Declaration of Authenticity, or Institutional Plagiarism Rubric

The story that the student is developing should be divided into sections, which support the general flow of the story. It should be emphasized that this is not an exhaustive list or a specific outline but a checklist. Each research project will require a specific structure that includes the relevant items that support the story. The topics in Table II-6-1 are elaborated below:

Title: A concise description capturing the essence of the investigation. Example: Agile Project Failures.

Front Page: This gives the title, the student's full name, the qualification for which the work is being submitted, the university name and the date of submission.

Abstract: This is a synopsis of the work and should provide a flavor of the research. More importantly, it should encourage busy researchers to read on. A brief informative summary of about 250 words **is** normally written as the **last** item in the project, when everything else is completed and so it can encapsulate what is actually known and what has been discovered. The abstract summarizes the content of the report, the way it is organized, the scope of the work, the research methodology used, and the main findings and conclusions.

Key Words: This is a list of key terms that define and classify the research. Examples for the Agile Project Failures report might include: Agile development, project management, project failures, agile project failures, agile methodologies.

Acknowledgements: This is an optional section that provides acknowledgements of help from supervisors, other members of staff, colleagues and any other relevant people who helped. Where access to companies, facilities, resources or individuals was provided, these must be mentioned and the relevant providers thanked. Students should not forget to give credit to any individuals who may have commented on early drafts of the work as well as helpful librarians and technicians.

Table of Contents: This table gives the full headings of all chapters (and the sections within them) with the appropriate page numbers. It should also list the appendices in similar fashion. Page numbers should be right-margin aligned.

List of Figures: If any figures appear in the text, this list will provide the number and name of each together with the relevant page number. Note, that sometimes this may be split into a List of Figures and a List of Tables (if the report contains many tables in addition to diagrams and charts). The figures must be numbered consistently using either sequential numbering (e.g. Figure 1, Figure 2, Figure 3) or numbering within the chapters (e.g. Figure 1.1, Figure 1.2, Figure 2.1, Figure 2.2, Figure 2.3, Figure 3.1). Both lists are optional and should only be used for a long report.

List of Abbreviations: If the student has used any sets of abbreviations many times within the text (of components, methodologies, phase names or different sections within an organization), they should be listed in this section for easy reference. This section typically comes just before the main report.

Introduction: The introduction contains a brief outline of the topic as a whole. The aims and objectives of the report are then stated. Questions to be answered include: What is the purpose of the report and what did it set out to investigate? There should be no indication of the author's own personal stance on the topic. The introduction is probably the first section that the student will write as it sets out the work and the approach. It is probably is also the last section that will be re-written to reflect the changes that have taken place.

Context: This section examines the organizational context of the project/ investigation/topic of report. For example, was the investigation carried out by a well-financed, well-resourced multinational organization, or was it carried out by a local group concerned about the environment? These factors may affect the information gathered and the approach taken. For example, the groups concerned may have talked to other businesses but found local residences uncooperative. Therefore, they were unable to give a clear idea of local feelings towards the proposed road or the new

initiative. The lack of money may affect the report of the small local group who might not be able to carry out large-scale surveys. They may rely on the generosity of others to gather scientific information and ecological studies.

Literature Review: The student must review previous research, highlighting useful and relevant work on which the student can build. Even a project focusing on a particular organization will benefit from a literature review!

Research Design (also known as Research Methods or Methodology): This section should include general research approaches, the information or data needed, methods for obtaining the data, sample sizes, and techniques for collecting and analyzing the data. The student should relate the choice of method to the objectives and be discriminating in their choice.

Results: This includes the data and findings

Evaluation: This is a discussion and analysis of the results with the aim of either validating or refuting the results. Here, the collected information is evaluated to determine what conjectures can be deduced from it. All information is brought together and analyzed and an evaluation is made.

Summary and Conclusion: The final chapter summarizes the research project as a whole, outlines the main findings, and lists the recommendations. The summary should include: What the student set out to achieve; how they went about it; and what they ended up doing. The Conclusion section is also likely to include any limitations on the interpretation and recommendations for future work to be carried out in this area. The project planning should also be described and critically evaluated in light of actual events. If certain aspects were compromised as a result, the student should explain why the decision was made and what impact it had on the project. Any omissions or scope reductions will contribute to additional further, work which can be recommended. The student should comment and retrospectively evaluate both the **product** and the **process** is used. Note, this chapter may be split into sub-sections, depending on the number and type of comments that have to be made.

References: This is a complete list of all the works referred to in the text and, possibly, in the appendices. Full bibliographical details are needed for each entry following the notation indicated by the relevant faculty members. If the student feels that there is a need for a brief bibliography that lists key books, papers and articles <u>not already referenced</u> they may also add a **Bibliography**.

Appendices: Any additional material that did not make it into the main sections, but which is relevant to the report, should appear as separate appendices. Such material should be self-explanatory or can be referred to from within the report itself. The appendices can also include material which was too lengthy for the main report,

big data sets that have been collected, or text and questions used in surveys and questionnaires.

Index: This is not normally required for undergraduate research projects.

Declaration of Authenticity: This is often required as part of the submission process in many universities.

Starting a Research Project

Selecting a Project

It is often left up to the student to determine which research methods are best suited to their project's context. It is important to note, however, that the choice of research method is not a simple decision, but a series of deliberations and questions that refine and address the required aspects of the research.

The steps required for setting up an adequate research design process can be formulated as follows:

1. Identify the research area
2. Define the problem and its boundaries
3. Consider and select an appropriate research philosophy
4. Establish the research strategy that will fulfill he main objectives (in terms of the research approach, specific research methods, and appropriate data collection techniques)
5. Produce the research design
6. Conduct the research
7. Gather the data
8. Analyze the data
9. Evaluate the findings
10. Write up the results.

The choice of research area may be made by students or be allocated to them. Undergraduate students typically have limited experience of project work and, so, the selection of suitable topics must be carefully considered by tutors. Some institutions prefer to allow students to select an individual topic. Others may offer a list of relevant topics or assign an entire cohort, or a group, to a particular topic of investigation.

Once the student has selected, or been given a topic (for example Agile Project Failures), it is important for them to read the available literature in order to form a basic understanding of the topic and its boundaries. It is particularly important to pay attention to controversies in the discipline, as they tend to point to the disputed aspects, and may offer a fertile ground for further exploration. The selection of a descriptive title for the project is an excellent start as it begins to define the context, the scope, and the

boundaries. Once the student has a working title, it is useful to pause and reflect on what the title conveys. It is particularly useful to consider each word in the title and how they relate together. Students should ask themselves if it is possible to interpret the title, and its individual words, in a different way from the original intention. For example, "Agile Project Failures" suggests at least three areas of investigation: failures in agile methods, failures in agile projects, and a combination that suggests failures that occur when agile methods are applied to projects.

The working title, and the student's growing understanding of the scope of the area, can help them to form a research question that they would like to investigate further. For example, the student may ask if agile project failures are different from more traditional failures. That question implies that the student should investigate the existence of something called "agile project failures" and determine if it occurs, if the instances are frequent, and what are the implications.

Research questions are a concise way of defining what the student is going to research in an objective way, free of assumptions and biases. Defining a good question is an art that will take time to master. However, the following questions provide a good starting point:

- Is the question testable?
- Is it ambiguous?
- Does it cover more than one particular possibility?
- Are all terms clearly defined? And agreed?
- Would everyone agree with the definition?
- Is it clear what needs to be tested or discovered?

Selecting a Research Approach

Research approaches are broad strategies for conducting research and there are many alternative strategies for conducting the research. Each strategy makes certain assumptions about the research environment and the type of question trying to be addressed. Each one also has certain benefits and drawbacks. The student's choice of a basic approach needs to be made explicit.

It is also possible that the project's objectives can be achieved by using different approaches.

One common way of looking at approaches is by distinguishing quantitative and qualitative features. Quantitative approaches focus on measurements expressed as numbers, while qualitative approaches emphasize words and include richer descriptions which explain feelings, moods and contexts.

Quantitative approaches: These primarily use experiments and surveys to collect numerical data. Theories are found in the literature, or proposed through data and observations, and experiments can then be decided to test their applicability. Quantitative research can take established aspects to new domains or contexts to measure applicability. The researcher's job is to identify causes, typically from the observed effects. These are often defined as specific hypotheses that examine relationships and impacts in detail. Research problems are reduced to questions about variables and impacts, which are tested to determine if the relationships are verified or falsified.

Qualitative approaches: These place a greater importance on the context and its impact. Theories are therefore built inductively from the data and insights that have been collected. Researchers collect much richer data that is analyzed in reference to social and cultural phenomena. The interpretation of knowledge by participants plays a key part in forming particular views and understanding of observed phenomena as explanations play a part in constructing a new understanding of events in the context of participants' comments. Qualitative methods rely on words, to convey feelings and perceptions rather than on numbers. Meaning therefore requires interpretation and sense-making in context.

Mixed methods approaches: Rather than treat the two extremes as totally distinct, it is possible to collect both qualitative and quantitative data from cases and use the two sets to provide a richer, yet a better-supported perspective. Hybrid, or mixed methods, are increasingly popular. The clear benefit is the ability to save time on the intensive and, often, laborious collection of qualitative data, whilst utilizing more efficient and early results from the quantitative study to direct the qualitative process. Mixed approaches can be applied in parallel or build on the results of one another to devise a more challenging and better informed set of questions and emerging understanding as research progresses.

One of the student's key objectives is to have a strong research underpinning for their approach. The following questions might be useful as part of the reflection:

- Is the approach appropriate to my research question?
- Will the approach enable me to arrive at the required type of result?
- What kind of result will it support?
- Have I the experience (or the skills) required to use this approach?
- Have I the time to apply it correctly and effectively?
- What are the limitations associated with this approach?
- Can I use it exclusively, or do I need to supplement it?
- Is this approach better than other approaches?

Selecting a Research Method

A rich variety of research methods can be applied to research projects. The following sections will explore surveys, experiments, case studies, action research, and systematic reviews.

Surveys: Surveys attempt to elicit information about a defined group of people at a certain point in time. Students may be familiar with surveys as they often get stopped by people asking them to complete survey questions. Surveys entail the selection of a sample group that represents the wider population. They are used to describe, highlight or measure certain generalized features or trends.

Examples of surveys include:

- Opinion polls prior to an election
- Student preferences for academic courses
- Examining the usage of sporting facilities on your campus
- Satisfaction surveys in the student canteen
- A national census that goes to all heads of households in a country

Note that not all surveys are conducted face-to-face as telephone interviews and various electronic media make new forms of questioning and interaction possible. One notable feature of surveys is that all subjects will be asked the same set of questions. As you can see from the examples above, some surveys may entail contacting every member of the population (or every household in a country in the case of the census), while other involve a smaller sample group. Selecting the sample size is an important part of adopting the survey approach as it can have a significant bearing on the results. Generally, sampling techniques will be used to create a reasonable subset of the population that will be contacted for the purposes of the research. Sampling assumes that the trends and patterns observed in the sample population, will apply to the population as a whole (assuming that adequate care was taken in selecting the sample population and that enough responses which are representative of the group have been returned). Note that one of the easiest methods of sampling is by creating a random sample, through the random selection of subjects out of a larger population!

The size of the population (and the number of subjects who return the forms or who are interviewed) is also crucial: the smaller the size of this group, the less reliable and less representative the results, due to the uncertainty about scaling them up for the entire population. The survey approach relies primarily on questionnaires and interviews (see Information Gathering Methods). Tests and observations may also be used to supplement other sources of information (but this is not standard practice). Note that surveys can allow some control over the uncertainties thereby enabling estimation of the significance of the findings.

Students are encouraged to pick any project to analyze. However, it is strongly recommended that they pick an organization or company they are familiar with and analyze a project in that organization. By picking a familiar project they can ask for and, usually obtain, realistic data.

Experiments: Experiments entail making changes to the value of a given variable (the independent variable) and observing the effect of the change on another variable (the dependent variable). They may also require the neutralization of other variables (the controlled variables) in order to eliminate their effects.

The setting of experiments can be crucial and requires attention to the setting of apparatus to collect and record the data. In the laboratory, experiments take place within carefully devised mechanisms so that the researcher has full control over the variables and the conditions. The researcher is thus able to manipulate the independent variables and measure the results in terms of the dependent variables.

Once the experiment moves outside the confines of the laboratory the researcher has to relinquish some of the control. This may result in unpredictable results and interactions making the field experiment more realistic, yet far more challenging for the researcher (in terms of control, setting up and drawing conclusions). Note that by moving away from the laboratory the researcher can no longer be said to be in control of the independent variable as it becomes dependent on other actors and relationships. Generalizing from the results of laboratory experiments can be problematic as students must show that their results will hold even when the variables are no longer under the sole control of the researcher.

If the student is planning to use human subjects, it is also very important to consider the choice of subjects and their skills, and to assess if they are suited for the experiment. Many universities have strict policies with detailed approvals that must be completed before any experiments can be conducted.

Case Studies: Case study research is particularly common in social sciences and medical studies, but is also gaining in popularity in other disciplines including business and management. The term "case study" is an umbrella term used in different contexts to mean different things that include a wide range of evidence capture and analysis procedures.

Case study research is an in depth analysis of a single instance in its natural context, which allows the researcher to focus on the phenomena of interest in great detail. A case study can be viewed as a way of establishing valid and reliable evidence for the research process as well as presenting findings which result from research.

Case studies can be viewed as a comprehensive research strategy, rather than as an information collection tool or a research design method. Information collection

methods for case studies often use observation, document, reading and interviews, but other methods can be selected to suit the particular requirements of a case and the general strategy. Case study work needs to be self-contained, but researchers have the luxury of being able to expand the boundaries to incorporate emerging patterns and perceptions. The data, and indeed the analysis, are grounded in reality.

Case studies are ideal for exploring interactions between people and their understanding of a situation. The richness of the data obtained by multiple means from multiple perspectives provides a real insight into the main issues at play. Case studies are useful in exploring novel situations in a real life setting and in covering different perspectives of the same problem. Case studies present difficulties in controlling variables, locating causes, and introducing potential biases. Preparing case study documentation can be time consuming. It is also tricky to try to generalize from the findings, especially when they only relate to a single case study, leading to doubts about the reliability and generality of any potential conclusions.

If the student chooses case studies as their research approach, they will be expected to clearly explain their choice of case, or cases. In order to relate it to the discipline and overcome the concern about the applicability of findings from a single case to the entire domain, the student will also be expected to explain why the case is relevant to the discipline and in what ways it is representative.

Action Research: Action research entails a practical project attempting to change the environment by solving a real world problem. Action research is conducted within the actual problem setting. The researchers become active participants and take an active role as members of the team. This implies having access to the team and the willingness to let the researcher join the organization and act as an integral part. Researchers thus play a part in developing the new reality and, through reflection, can revise existing theories on the basis of their individual experiences. In order to belong to the team, the researcher needs to have the skills that are required for completing the tasks allocated to the team.

Action research starts with a problem in need of resolving and attempts to engender the change needed in resolving the problem. Participation in the activity brings the researcher much closer to the action, but also means that she/he plays a part in shaping and directing it. Intimate interaction with the problem may mean sacrificing some of the more general perspective through focusing on smaller and more localized detail.

Note that unless the student is already working on a project and considered as part of the team, it is unlikely that Action Research can be implemented in any effective way over the course of a single semester project.

Systematic Reviews: The literature survey, as well as additional documents that may be available, can provide a valuable source of information that is needed for providing a foundation for research and for supporting further work. Systematic literature reviews of primary or secondary sources are an evidence-based approach that can provide background, historical and supporting information and be useful in identifying trends and particular solutions or approaches that may be helpful in practice. Such reviews need to be carried out with a clear purpose related to the problem the student is trying to solve.

Alternative research approaches may involve narrative inquiry, ethnographic studies, phenomenology or grounded theory. It is unlikely that any of these forms will be used in an undergraduate student report unless the student is already familiar with the method.

Selecting a Data Gathering Method

There are a number of trusted and well-used techniques for collecting data. Many of these techniques are used by systems analysts and business analysts. Typical methods for gathering information (sometimes encompassing both facts and feelings) include:

- Questionnaires
- Interviews
- Observation
- Documents

Note that perhaps not surprisingly, data gathering methods rely on the use of different senses. The key skills that are required to use them effectively are listening (during interviews), seeing (observation and once again observing reactions during interviews) and reading (documents and questionnaires). It also helps if the student can read between the lines and identify trends and hidden meanings.

Generally, the student will find that certain research strategies tend to be associated with specific methods for data collection. Questionnaires and interviews, for example, are often associated with the survey approach; while observation will typically be connected to experiments. However, it is still up to the student, as the researcher, to select the most suitable method within their research strategy and to make choices about how to implement items such as the size of the sample, the number of documents, the time per interview, etc. The student's choices will reflect the priorities and constraints of the project. Hopefully students will also show a clear understanding of the principles of research and the relative merits of their decisions.

The four main data gathering methods are detailed below.

Questionnaires: A questionnaire can produce useful data for a project, provided the necessary detailed work is done in advance**.** Note that questionnaires have been described as the most difficult method of information gathering to use successfully. Typically questionnaires are employed in measuring political opinions, consumer preferences, usage patterns and scope, functionality, and perceived cause-effect studies.

Advantages of Questionnaires:

- They achieve **wide coverage**
- They are **fast** in terms of reaching a large or geographically dispersed group
- They are relatively **cheap** to produce and administer to a large group
- They are **standardized**, ensuring identical questions are asked of all subjects
- They can be **anonymous**, if that is desired, but can also allow full and honest answers
- They are suitable for **extending** data collection beyond the interview

Disadvantages of Questionnaires

- They need to be **carefully designed**, requiring specialist skills
- Their design can be **time-consuming**
- They are normally subject to **poor response** rates (a typical return rate in the region of 10%)
- One **cannot check** or validate the results unless the respondents are named
- One is only analyzing the results of those who bothered to return the forms, so there might be a **bias.**

Interviews: Interviews are used in many student projects. They are a type of meeting used to collect information verbally. The purpose of conducting an interview is for one party, or both, to gain information, as well as elicit mutual confidence and trust. In many situations, the first step in dealing with a problem is to interview someone carefully about it. All interviews need to be documented and the interview reports, or transcripts with their subsequent analysis, will form part of the project report.

Interviews come in varying sizes ranging from one-to-one (with one interviewer and one interviewee), via group interviews where 4-6 people meet together with the interviewer to talk about certain topics, to focus groups where a small group is brought together to explore attitudes and perceptions.

Interviews are particularly useful in their openness to the investigation of new directions and topics as they emerge, in the flexibility that they encourage, in fostering a

positive relationship between interviewer and interviewee, and in having a live guide who can direct the process.

Interviews tend to fail for two reasons:

- Inability or unwillingness to listen
- Inability or unwillingness to establish an open relationship.

Remember, an interview is a form of conversation between two parties. Many people who cannot express themselves well in writing may be able to discuss their feelings during a conversation. Listening is an important part of any dialogue. After every interview, the student should try to evaluate their own performance. When they discover problems, they should develop techniques to correct or avoid the triggering situation in the future.

Observation: This involves the scrutiny and recording of actions in natural settings. Detailed observation is, in general, not a very effective way of obtaining the kind of information required for answering management questions. Other major drawbacks are the ease with which people can be antagonized if they are being watched (or even if they think they are) and the fact that behavior changes when people are being observed, and not always for the better. There is also the need to negotiate agreement from the organization for the student to be present for prolonged periods to observe their operating procedures.

Observation is also very expensive in terms of time. Furthermore, it does not reveal emotions or feelings, or provide any rationale for particular behavior patterns.

However, when a special event or a critical time is anticipated, it may be worthwhile to observe a special occurrence to see if it is approached differently and what kind of special behavior patterns it stimulates. Observation is direct and focused and can concentrate on a specific aspect, as required, and uncover unexpected relationships.

If the student intends to use observation as a technique, care must be taken to document the activities thoroughly. The student needs to decide in advance: the plan for observation, what is to be observed, the method of recording observations, and how the observations are to be analyzed.

Informal observation, simply being present and being observant, can be very valuable in getting the feel of a particular organization and the way it is managed. Look for piles of papers, closeness of supervision, frequent interruptions, bad time keeping as well as the positive signs of a productive and efficient work place. This can be done during a visit or on your way to an interview. However, remember to be careful of such subjective information, which can be embarrassing, misleading and out of context.

Documentation: Documentation can include both written and non-written documents. Document scrutinizing and record searching are often useful in establishing quantitative information about data and procedures. For example, a simple record search can reveal the number of customers or the number of fields per record. It can further highlight the typical number of transactions per record or the forms and data that needs to be filled for a particular task.

Document searching is useful because it relies on documents that are already in existence thereby providing a good introduction to the work, the participants, or the departments and organizations involved. Operating procedures, organization charts, forms, publicity booklets, job descriptions, statements of company policies and manuals can be useful in detailing how work processes are supposed to be followed according to organizational guidelines and, in providing a background to the organizational setting. It can also be very instructive to compare filled-in documents and forms, with organizational procedures dictating how they should be completed. Sampling a set of documents can also be useful for identifying typical mistakes, shortcuts and revised procedures.

Document searching can also be useful in confirming points that have come up during interviews. However, documentation is not always kept up-to-date. Furthermore, in most situations there is either insufficient documentation or an overabundance, making it impossible to trace the relevant sections.

It is important for the student to look again at their objectives and the choice of their research approach to ensure that their data collection method is consistent with the overall philosophy of the project. Useful questions to ask include the following:

- It is possible that more than one technique is suitable?
- Is my technique appropriate for my problem?
- Is my technique suitable in terms of the research approach?
- Are there any alternative techniques that I could use?
- What are the main benefits from using the technique I selected?
- What are the drawbacks?
- Would any of the other alternatives offer a better balance between benefits or drawbacks?
- Is there any point in combining techniques? Have I time to do that?
- Do I know how to use this technique?
- Do I need any special skills?
- What do I need to learn?
- Do I have enough time to apply the technique?
- When can I start?

Student Guidelines

The Issue of Plagiarism

Plagiarism is using words and ideas from another text without acknowledgement and without referencing correctly where the information came from. It can occur through negligence, foolishness or deliberate intent. Often, plagiarized sections in reports stand out because they are written in a different style from the rest of the report. Faculty members, or persons marking the report, will often be familiar with the main texts on the subject the student is writing about. They will also be aware of the main arguments and theories and, so, trying to pass something off as the student's own work is not that easy. Copying another student's work is also plagiarism.

Plagiarism is dealt with severely in universities and can result in dismissal from the institute. Students should be aware of the plagiarism policy in their university.

How to avoid plagiarism?

If a student uses quotes or text from another author, they should make sure that they reference that work correctly. Ideas can also be plagiarized and, so, these need to be referenced as well. The reference should include the author's name, the year of publication and the page number. The references at the back of the project should give the name of the author, the chapter name, the name of the book, the page number, the year of publication, and the publisher. Each discipline within a university has its own format for referencing material.

When summarizing from books, or journal articles, make sure that they are written in your own words if you are going to use them in your essay. Read over your summary and check that the phrases and sentences are structured differently from the original text. Use your own examples. Some information that is well known and agreed upon does not need to be referenced, for example "London is the capital of England" or "smoking is bad for your health."

Make sure words and ideas taken from other works are referenced correctly. When summarizing ensure your own words and phrases are used. The penalty for plagiarism can be very severe and, so, if in doubt, add a reference. If you are unsure about a different type of reference, ask for help.

Major pitfalls

Some of the most useful things to know about individual research projects are the common pitfalls. This list can be used as a partial checklist or an informal risk assessment exercise. Here are some of the common causes of failure:

- A large number of small annoying errors, which could have easily been corrected through proof-reading and careful use of a spell-checker.
- Choosing/Starting the project too late. Submit your project proposal on time and start the project as soon as you can. The longer you leave it the harder it is to get motivated, especially when all your friends seem to be flying ahead.
- Failing to meet your supervisor regularly. If you arrange a meeting with your supervisor, turn up at the agreed time. If you are stuck for any reason and you have no meeting arranged, contact him or her immediately. You gain no sympathy from anyone if you lose contact with your supervisor and produce a poor project as a result. Your supervisor will be happy to help you but they can do nothing if they are unaware that you are having trouble.
- An inadequate literature review.
- Allowing too little time for writing the report. You should try to produce as much of your report as you can as you go along. The last two weeks of the project should be dedicated to pulling together the material you have accumulated and producing a polished final product.
- Over/Under Ambition. Try to be realistic about what you can achieve in the time available. A good project requires a lot of input from you and should prove to be technically challenging throughout. At the same time, however, it is better to do a small job well than it is to fail to do a big job at all. Your supervisor will advise you on his or her expectations of the project and this will help you to set your sights accordingly.
- Blind Assertions of fact. Avoid the assertion of facts, often as a list (e.g. the critical success factors are… OR it is known that…). Everything in your report has either an external source or is a result of your work. Either way, make the source clear. It should be clear whether the assertion was derived through logical argument, practical evidence and results or evidence from the literature. Only repeat an external source list if you intend to discuss every point.
- Lack of clear explanation of your reasons for making decisions during the course of the project. Decisions, in particular ones involving selection of methods and choices need to be justified.
- Unsourced complex diagrams. A diagram is supplied without a source. Give the source. If you have adapted several sources make clear the contribution of each.
- Lack of definitions of terms or acronyms, which spoils readability.

- Perfectionism. Try to avoid the tendency to perfect every task. A 'good enough' project finished on time is better than the promise of unfinished 'perfection' (see over-ambition above).

Tutor & Facilitator Guidelines

General Guidelines

During the course, the faculty member should regularly discuss the students' projects and not leave it until the final few weeks. The goal should be to provide constructive feedback throughout, and answer ongoing questions as they arise. Students should be advised early on as to whether they appear to be proceeding in the right direction and, especially, to ensure that their project is feasible.

An important aspect of the project is that there should be a significant contribution in terms of the research methods and approaches. Selecting a feasible combination of methods and approaches is essential, and requires the faculty member to be vigilant to ensure the students do not proceed in the wrong direction.

Group or solo projects?

Research projects can be done by individuals in solo mode or as a small group enabling the group to scrutinize a greater range of sources and marshal a larger body of evidence. It also relies on having the time to coordinate and liaise and may require greater attention to the functioning of individual members. The choice relates to the size of the group and the preferences of the tutor.

Submitting project proposals?

Given the importance of research projects, there is a clear need to involve faculty in approving the titles and approaches selected by students. One solution is to get students to submit a formal proposal for the project. Another approach is to allocate agreed topics or to negotiate the topics upfront during the initial weeks. Ultimately, the choice also depends on the length of the module/course, and the time available for working on the assignment.

The need for Presentations?

Individual or group presentations can be used as part of the assessment and development work for the research paper. The advantage in preparing a presentation is that students get to engage with the material at a more intensive level, as the preparation of the presentation forces the presenter to master the topic. The other key advantage is the ability of other students to engage in the topic (assuming that each group or individual is working on a separate topic) and provide additional feedback, which makes for more relevant learning. Presentations require time to prepare and will

use up in class sessions and, hence, require careful consideration and planning. It is typical to allocate 25-30% of the marks to presentations. Response to feedback, or at least consideration of given feedback, could also be added to the marking scheme rubric following presentations.

Grading Research Term papers

A detailed marking criteria is provided below, see table II-6.2. The detailed scheme covers 18 key aspects and can be tailored to the specific requirements of a faculty member by removing some of the aspects. Tutors can also decide if some of the aspects count for more.

The criteria can also be utilized as a marking rubric, see Table II-6.3, where checks (or ticks) are applied against each item. Rubrics provide a simple communication tool, and have proved to be a useful tool for students to rank their own work in advance of submission so they can gauge and frame their expectations.

Table II-6.1: Project Marking Grid

	Fail	**Poor**	**Average**	**Good**	**Excellent**
Abstract	Abstract missing.	A poorly structured paragraph.	Insufficient definition and clarity. Very basic coverage of aims, approach and conclusions.	Defines subject but summary of aims, approach and conclusions incomplete.	Clearly defines subject. Includes aims, approach and conclusions
Introduction	Introduction missing or irrelevant. Aim and objectives not clear. Topic not introduced.	Reasonable attempt to introduce topic and aim of project.	Aims and objectives of project made clear.	Clear and concise indication of aims and objectives clarifying the background. Particular areas of research topic of work identified.	Precise description and explanation of all objectives. Concise, clear sets scene and presents summary for rest of document.
Problem definition	No attempt to define scope of topic or a totally misunderstood or irrelevant scope. Major areas left unexplored.	Scope definition contains many omissions and misunderstandings. The problem definition and its context is included but raises as many problems as answers.	Attempt to cover scope contains some omissions/ misunderstandings/ irrelevant material. The problem definition and its context is well presented but the supporting arguments lack depth.	Good attempt to reflect scope. The problem definition and its context is generally well presented. Most key points covered.	Excellent interpretation and conceptual grasp. The problem definition and its context is fully presented to a knowledgeable reader. Scope appropriate. Almost all significant points covered.

	Fail	Poor	Average	Good	Excellent
Concepts (understanding and application)	Concepts are not explained or are incorrectly applied. Very little or no understanding of the issues raised by the topic (or serious misunderstanding of the topic). Content largely irrelevant.	A few underpinning concepts are presented with only a minority well understood or applied. Understanding appears superficial and/or confused. Contains irrelevant material.	Some underpinning concepts are presented with some well applied. Basic awareness of the issues, but at a general level or awareness of only some of the issues.	Most underpinning concepts are presented with all well applied. Clear awareness and exposition of relevant issues. Some awareness of nuances and complexities.	The relevant concepts are understood and are explicitly articulated within the report and well applied. Excellent exposition of relevant issues. Good awareness of nuances and complexities. Insightful and well-informed.
Use of literature	No references to literature or even to class notes in relevant topic. Inadequate or inaccurate information.	Little evidence to support arguments and inadequate coverage of basic sources. Few citations in writing. Only a minority are academically respectable references.	Weak inconsistent use of evidence to support arguments. Insufficient evidence of research in terms of identification of relevant source material. Most references are academically respectable (with low proportion of newspapers and web addresses).	Good use of evidence to support arguments. Relevant published material utilized to support critical evaluation. Evidence of a comprehensive coverage. Good use of citations avoids unnecessary description of other's work. Cross-section of classical and up-to-date references including specialized journals and conferences.	Excellent use of evidence to support arguments/ points. Substantial evidence of good use of a wide range of sources. Use of up to date information and relevant sources. Material used includes different types of evidence including contradictions and challenging information. Excellent balance between classical and recent academic references.
Relevance of Research	No research is included, or all research presented is irrelevant.	Some research is presented; but the majority is disjoint from the work presented.	There is some research presented but it does not fully underpin the project.	The research is sound but lacks aspects of coherence to the project.	The research undertaken is relevant, sourced and critically reviewed in a synoptic fashion.

	Fail	**Poor**	**Average**	**Good**	**Excellent**
Method Selection	No attempt has been made to discuss the approach, or a totally inadequate choice. No understanding of merits or concerns associated with the selected method/s.	An acceptable approach is discernible but not well explained. Some evidence of little regard to appropriateness of the method.	An appropriate approach has been adopted with some unexplained deviations.	A sound approach has been used throughout, but the argument omits some of the justification steps. The method itself is clearly set out and explained. Variations used are fully justified.	A reasoned selection of the available options and the approach selected. Disciplined, well-planned choice – may also include adjustments to approach. Similar justification of the choice (and range) of methods and tools.
Analysis/Design	Little attempt at analysis, synthesis and design. Wrong problem addressed.	Major gaps in the analysis and/or design with respect to the original problem.	Evidence of analysis and design which appear incomplete in comparison with original problems. Some missing aspects.	Evidence of analysis and design in respect to the original problem.	Analysis and design is explicit. All problems addressed.
Overall approach	No understanding of conceptual framework. Report appears overly descriptive and includes many errors and omissions.	Weak understanding of conceptual frameworks. Over reliance on undigested sources or a superficial perspective. Too descriptive.	Little questioning of sources, but evidence of a critical approach applied in places.	Some evidence of a questioning approach. Good standard of critical analysis.	Questioning, unbiased approach. Clear evidence of independent thought. Excellent standard of critical approach.

	Fail	Poor	Average	Good	Excellent
Results	No significant results. No attempt at discussion or justification.	Similar findings are widely available. Distinctive aspects of the problem not covered.	Weaknesses detract seriously but are acknowledged.	High standard reached. Findings fit the problem studied and alternatives are compared. Clear indication of assumptions and crucial trade-off decisions.	Results offer a notable original feature, quality or purpose. Pathway indicated for further development. Findings are original and could be applied in other projects and appear superior to the usual alternatives. Deep understanding of assumptions and trade-offs.
Evaluation (of both product and process)	No attempt at evaluation. No recommendations stated. No clear idea of how, or if, the recommendations could be implemented.	Lacks objectivity. Only minor relevant evaluation of the work is presented. Limited evaluation without clear links to the objectives.	Some evaluation with some links to work undertaken. Many key issues identified.	Significant evaluation of the outcome (or product) with little emphasis on the process and methods. Clearly stated evaluation firmly based on evidence provided. Feasible set of recommendations linked with project objectives.	Reflective and insightful evaluation. Assessment of both process and outcome. Choices of approaches and methods re-visited in light of outcomes. Objectives fully reviewed. Clear understanding of potential and limitations. Appropriate and realistic recommendations consistent with results.

	Fail	Poor	Average	Good	Excellent
Conclusion (section)	No recognizable conclusion.	Conclusion perfunctory. Descriptive summary of projects contents.	Conclusion does not do justice to the report. Inadequate summary of key points/ issues/ outcomes. Conclusions drawn but insubstantial or unproven.	Good. Summarizes key points/ issues and outcomes. Conclusions drawn, supported by body of writing.	Excellent. Accurately identifies and summarizes key points/ issues and outcomes with reference to the original problem. Critical, reflective conclusions. Propose new work in light of findings. A convincing argument shows that the recommendation is superior to the usual alternatives. Discussion of limits and reservations (and alternatives obvious in retrospect).
Logical flow of ideas	No logical structure and no evident story line.	Arguments confused or not fully developed.	Arguments not developed. Arguments not always clear.	Arguments clearly structured and logically developed. Evidence of a story line developing. Uses headings, introductory statements and summary to provide narrative links.	Convincing case made. A clear story line forming a coherent argument. Aims, arguments and conclusions fully compatible. Chapters well-organized and fit together.
Structure of report	No evidence of any attempt to plan and construct the report. A loose collection of ideas or irrelevant information. No sequence and links within chapters.	Little if any of the report is well constructed. Collection of self - contained sections.	The report lacks coherence or addresses only significant issues. Structure flawed but sections reflect project aims.	Most of the report is well constructed with the correct use of English and addresses many of the issues noted above.	The report is well constructed with the correct use of English and addresses all the issues noted above.

	Fail	Poor	Average	Good	Excellent
Spelling, grammar and Syntax	Frequent errors- Punctuation, misuse of words, spelling, sentence construction make the work largely incomprehensible	Many errors – punctuation, misuse of words, spelling, and sentence construction occasionally make meaning unclear.	Occasional errors – punctuation, misuse of words, spelling, sentence construction.	Acceptable standard. Few errors, typos.	Very high standard. Negligible errors.
Clarity and style	Style makes work largely incomprehensible. A self-centered ramble evoking emotive terms.	Style too colloquial or makes work difficult to understand. Lacks objectivity.	Style acceptable. Coherent sentence content and correct choice of words. Little use of first person.	Effective use of English. Clear and easy to read. Content free from generalizations and unsupported statements and opinions.	Very effective use of English. Clear, concise and easy to read. Impartial academic style.
Data and references	No use of relevant data, tables, figures, diagrams etc. No referencing and/or bibliography. No apparent understanding of system of reference.	Poor use of relevant tables, examples, figures and data to break up text. Some errors in citation including missing or incorrect citations.	Some good use of relevant tables, examples, figures and data to break up text. References accurately cited and listed most of the time.	Good use of relevant tables, examples, figures and data to break up text. References accurately cited and listed.	Excellent use of relevant tables, examples, figures and data to break up text. References accurately cited and listed.
Overall presentation	Unacceptable presentation. Pagination, title, margins and paragraphs need serious attention. Repetitive content.	Unacceptable presentation. Pagination, title, margins or paragraphs need some attention.	Presentation generally satisfactory. Acceptable appearance. Correct use of paragraphs, headings, sub-headings, numbering, sections.	Carefully organized. A good standard of appearance, neatness and legibility..	Excellent presentation. Carefully organized and well-presented Interesting to read and visually appealing.

	Fail	Poor	Average	Good	Excellent
Abstract					
Introduction					
Problem definition					
Concepts					
Use of literature					
Relevance of research					
Method selection					
Analysis and design					
Overall approach					
Results					
Evaluation					
Conclusion					
Logical flow					
Structure					
Spelling					
Clarity and style					
Data & references					
Overall presentation					