Appendix A
Fundamentals
Of
Industry Based
Project/Work Experience

1. Introduction

Each year, Australian universities place students into companies so that they can undertake projects, work experience, major and minor thesis research work in an industrial setting. This has enormous potential benefits for the students and potential benefits for the collaborating company. However, there are also challenges and difficulties that need to be understood and resolved in order for projects to be carried out successfully, and in order to support the safety and well-being of students.

Primarily, this guide is aimed at students undertaking projects with collaborating organisations, typically companies but also potentially public service entities. The general contents of this guide are also suitable for students undertaking work experience during the course of their studies. The guidelines in this document are set out in order to ensure:

(i) Clarity of purpose and outcomes in regard to student projects.

(ii) That students and the university are positively viewed by the company.

(iii) That both the student and the company achieve a positive outcome from the project.

(iv) That students who have not previously had industry experience understand the basic principles of collaborative projects.

(v) That students are not mistreated by companies or placed into hazardous situations.

At the outset, it needs to be made clear that students who believe that their personal safety or emotional well-being is placed in jeopardy by their role in the collaborating company should report this to their relevant academic supervisor immediately so that the University can address the problem.

2. Background to Projects

Industry based projects that are established by universities for the benefit of students are generally the result of discussions that have taken place between university academic staff and company representatives. During the course of project establishment, companies often suggest a number of project areas that may be suitable for students. In collaboration with the companies, a final list of projects is assembled. Students are sometimes asked to nominate for various companies by submitting a summary curriculum vitae. Sometimes, students are simply allocated to company projects.

The nature of projects is often predefined before students first make contact with their collaborating company. Sometimes, however, the nature of projects changes because:

- Company requirements have changed since the time of project formulation.
- Company staff have changed.
- Equipment or supervisory resources have changed.

Students therefore need to be prepared to accommodate variations to projects in the early stages of their work. The key point is that a final project outline has to be clearly defined and agreed upon as soon as practical after the student commences project work. Finite outcomes (deliverables) need to be mutually agreed upon by the company, the student and the supervisor.

Companies generally take collaborative projects and work experience very seriously because they consume staff resources, in terms of supervision, and because companies sometimes have to reveal sensitive information to students. Students are therefore expected to conduct themselves in a professional manner and to make every effort to contribute to the successful completion of the project. The following points need to be noted:

- Students who are not employees of the company are not normally required to perform day to day work activities of the company. They are only required to contribute to the successful completion of their specific project.
- Students are generally expected to be at a collaborating company in accordance with their project requirements, and at times that accommodate the schedules of collaborating staff. However, if students are not employees, they do not need to be at the company for a full working week unless their project demands it.

3. Presentation and Behaviour

3.1 Presentation/Deportment

Companies generally project a particular image in regard to their employees in terms of presentation. For example, companies operating out of central business district offices, generally expect male staff to wear suits and ties. Although there may be no formal dress code in a particular organisation, there is generally a standard of attire that is expected from staff.

Students need to present themselves in a professional and business like manner. This means that dress, grooming and presentation should be in line with company expectations. If students are working in an office environment, particularly in central business districts, it is generally expected that employees wear formal business attire – in the case of male students this would be a suit and tie and leather shoes. In a factory based organisation the dress standards may be less formal but, in any case, it would generally be expected that students not wear jeans, tee shirts or sports shoes.

It is equally important that students should not "overdress" and alienate themselves from collaborating staff. A good way of overcoming this problem is for students to dress well on the first visit and, while touring the company premises, make a mental note of the standard of attire used by their peers and other general staff

Some companies can take exception to the standard of attire worn by students and this can color their view of the entire project. It is important therefore that students do not jeopardise an important opportunity for learning and development over a small issue such as deportment.

3.2 Behaviour

Students should take careful note of the way in which staff address each other in collaborating companies. If in doubt, it would be polite for a student to ask senior staff how they would like to be addressed. It should not be taken for granted that a senior staff member will approve of being addressed by their first name. A good way of resolving the problem is for the student to ask:

"How would you like to be addressed while I am working here at the company? Should I address you as Mr. X?"

Companies are also sensitive about which people are spoken to, and how they are spoken to. For example, in some companies it would be inappropriate for a student to directly approach factory floor staff and discuss issues about productivity improvements leading to staff reductions. If in doubt about behaviour or protocols for discussing issues with staff – always ask:

"Do you think it would be appropriate for me to discuss the issue of productivity improvements directly with Mr. X?"

As a general rule, unless a company liaison person has indicated that a student should talk with other staff, the student should get permission before doing so. A general question at the start of the project would be useful. For example, *"During the course of my project I will need to discuss issues and get information from various people around the office. Should I confer with you before discussing any particular issues with other staff?"*

Whenever students meet a member of staff in a company, they should formally introduce themselves on the first encounter:

"Hello, my name is X. I am an engineering student at the XX University. I am currently undertaking my XXX degree. I am here to do an industry-based project as part of my studies…"

Company representatives are generally busy with day to day activities and quite often students are intimidated when they are brushed off by a company representative who tells them that they are busy. The polite way to resolve this problem is to ask to schedule a meeting that suits the company representative:

"Could you tell me what day and time would suit you to make an appointment to discuss some issues relating to my project? I can work the meeting time around your schedule."

A key rule to remember is that, as outsiders to the company, it is important that students do not express personal opinions on either technical or other matters unless specifically asked to do so. Generally, students should otherwise stick to facts and analysis.

4. Discussions with Company Staff

4.1 Initial Meeting

Company representatives are generally very busy people. For this reason it is important that students are not seen to be wasting staff time. Whenever students initiate a meeting with company staff, the meeting should have:

- A specific objective
- Specific outcomes and actions.

When a student first meets with company representatives it is generally polite for the student to introduce himself/herself and provide a very short background, covering the following points:

(i) Student's full name and the name by which the student would like to be addressed while at the company.

(ii) Purpose of the interaction (e.g., *"…I am the person that has been appointed to look at the scheduling issues in your casting plant…").*

(iii) Who initiated the interaction (e.g., *"…This project was put together by Dr. X from XXX University and Mr. Y from your company…").*

(iv) Short summary of background (e.g., *"…I am completing a degree in business and economics, and this work constitutes part of my final year thesis…"*).

Following the introduction, students should immediately make it clear why they are meeting with the staff and what they expect out of the meeting:

"…As you are aware, I will be starting my project work in the next few days, so the objective of this meeting is to go through the preliminary issues that we need to cover in order to get the process started and ensure that the project proceeds efficiently..."

Where applicable, students should also make it clear from the outset that they are not to be confused as employees:

"…As you may be aware, my involvement with your company will be to undertake the project that was negotiated between the company and the university. As such, I will not be here to act as an employee but I will be trying to contribute to your company through the successful conduct of my project…"

Students should also ensure that the following company induction issues are addressed at initial meetings:

(i) *"Can you tell me the names of the staff I will need to liaise with while conducting my project?"*

(ii) *"Do I need to have a visitor's card or badge?"*

(iii) *"Can I park my vehicle in the company car park?"*

(iv) *"Do I need to participate in a safety induction program before commencing my project?"*

(v) *"With whom can I discuss the project outside the company?"*

(vi) *"Are there any safety issues I need to be aware of before commencing?"*

(vii) *"Which staff can I discuss the project with?"*

(viii) *"Do I need permission from anyone before approaching staff or visiting particular areas of the organisation?"*

(ix) *"How can I notify reception to ensure that they know who I am in case someone telephones me here?"*

The final outcome of the initial meeting should be to set the next meeting time, at which a formal project proposal should be established:

"…I would like to set up a time to meet with you formally in two weeks time, so that we can finalise the project with mutually agreed milestones and outcomes"

4.2 Getting the Company Profile and Key Issues

In order to conduct any meaningful project or minor thesis research work with a company it is important that students have a good understanding of the company. For this reason, they should initiate a meeting with relevant staff in order to ascertain the following information (some of this can be derived from an annual report but it needs to be followed up with discussions with staff):

(i) The background of the organisation – Who owns it? Is it a subsidiary of a larger company? Is it a public or private company? How long has it been operating?

(ii) What products and/or services does the company provide?

(iii) Who are the typical customers and what is the profile of customers – Are they large or small? Are they local, interstate or international?

(iv) The financial perspective of the organisation – What is the turnover of the entire organisation? What is the turnover of this subsidiary? Is the organisation currently profitable?

(v) The staff profile – How many staff does the company have? How many are management? How many are professional? How many are technical? How many are trade? How many are semiskilled? How many are unskilled? What is the staff turnover like?

(vi) Who are the competitors to the organisation?

(vii) On what basis does the organisation compete (i.e., price, flexibility, responsiveness, technical expertise)?

(viii) What are the key factors that influence the organisation's competitiveness (e.g., labour cost, supply chain management, logistics)?

(ix) In order of priority, what does the organisation believe are currently its greatest challenges/problems/threats (e.g., international competition)?

(x) In order of priority, what does the organisation believe are its greatest opportunities (e.g., new products; entering the Asian marketplace)?

A student will be working in a particular area of an organisation. The following information also therefore needs to be obtained:

(xi) What is the nature of the area and how does it interact with other areas?

(xii) How many staff work in the area?

(xiii) What are the key issues/challenges in the area and how does the current project relate to these in terms of importance?

4.3 Project, Milestone and Outcome Definitions

The single, largest cause of project failure in collaborations with industry partners arises from poor project definition combined with a misunderstanding of milestones and outcomes. Each party in a collaboration generally believes that it understands what the outcomes and milestones are intended to be but often this understanding varies from one person to another. For this reason, it is absolutely imperative that project outcomes and milestones are recorded in writing and each member of the collaboration has a written copy of what has been agreed.

The basic rule of thumb is that students should promise less than they can deliver and then deliver more than they promise. This prevents collaborators from being let down or feeling that they have been misled by students.

It is entirely inappropriate for students to promise things which they do not believe that they can deliver upon. For example, if a student promised to deliver "a working software package", a collaborating organisation may assume that the student can develop a fully operational and professional piece of software. Generally such an outcome would be completely infeasible in projects and minor theses. A more realistic promise might be *"a prototype piece of software that would later need to be developed by a professional IT person"*.

Students are often intimidated at early meetings and feel that they will make a better impression by agreeing to company outcomes or milestones which the students themselves do not believe in. This is very poor practice and it needs to be corrected from the outset with a polite response:

"I'm sorry but I do not believe that I can have a full scheduling algorithm completed by the time the next meeting arrives. I can however provide you with an overview of the method that will be in place and a progress report on how the algorithm is proceeding…"

One of the most difficult aspects of collaborative projects is that students need to balance the need for understanding their own limitations with a preparedness to extend themselves.

At the end of the introductory phase of the project, the student should have clearly agreed with his/her academic and company supervisors (in writing):

(i) The definition of the project

(ii) The specific outcomes of the project that will be delivered to the company

(iii) The form of the outcomes (e.g., a spreadsheet and report; a Powerpoint presentation; a thesis, etc.)

(iv) The milestones and milestone dates for various phases along the way

(v) The reporting schedule by which the company and academic supervisors will be kept up to date with progress

4.4 Resourcing Issues

Some projects require specific resources in order to be completed. For example, a project may require workpieces to be removed from a production line for destructive testing, or perhaps the use of technical staff to do metrology measurements. Companies generally place a value on all workpieces, scrap, staff times, etc. so it cannot be simply assumed that such resources will be given to the student without prior notice.

As part of the original project definition, it is important that students agree upon the resources to be supplied by the company and the university. It is also important that students advise the company when such resources are required in order to enable them to plan for expenditure or changes in staffing. In some instances it may not be known, from the outset, what specific resources are required, and the requirements may only become apparent when the project progresses. In any event, it is critical that students advise company and academic supervisors of impending requirements as soon as these are known.

In some instances, companies may refuse to provide resources which are required to complete a project:

"…your project is no longer a priority at this point in time and because our cash-flow position is tight, we have decided not to purchase the modeling package we initially agreed upon…"

In other instances resources may be delayed, for any number of reasons, thereby leading to problems with project milestones. Students can only deliver outcomes based upon provision of resources so, if resources change, it is vital that students contact their supervisors and organise for a meeting to redress the issue. Obviously if a company collaborator has decided not to fund a resource because it does not have the money, then the project has to change. It is the student's job to then get agreement on a redefined project:

"…The outcomes we agreed to at the beginning of this project were conditional on us having a simulation package. It appears that this is no longer an option so we have had to change the program outcomes accordingly. The purpose of this meeting is to get agreement on a new set of project outcomes and milestones based upon using a spreadsheet package instead of the originally intended simulation package…"

4.5 Reporting Issues

Students are often intimately involved with their own project and lose perspective of the significance of their project relative to other day to day company activities in which other employees are involved. A student's project may be low down on the priority list of a senior company person who has many staff and resources to supervise. For this reason, it is important that students keep their company liaison people informed of the current state of the project. Sometimes this requires that students are assertive and organise meetings to keep company staff involved – even if they are reluctant to do so. Without regular feedback, student projects may be relegated lower and lower on the list of staff priorities and a positive outcome may not be achieved because the project loses a staff champion within the company.

Student meeting sessions with company staff should be kept to as short a time as possible – say 30 minutes maximum for presentation and question time. The agenda for reporting should be along the following lines:

(i) Summary/restatement of project objectives (sometimes company staff need to be reminded of what the objectives are, particularly when they have many different tasks under way) ***(2 minutes).***

(ii) Restatement of mutually agreed outcomes and milestones ***(2 minutes).***

(iii) Summary of progress to date and progress/outcomes since previous meeting ***(4 minutes).***

(iv) Summary of outcomes to be achieved by next meeting and current project timeline relative to original plan ***(2 minutes).***

(v) Question/discussion time for staff ***(10 – 20 minutes).***

Total Meeting Time is approximately 30 minutes. At each meeting hand out a summary sheet of the project status. This should not exceed one page and should cover the issues in (i) to (v) above.

4.6 Technical Feedback

Feedback is essential in order for students to determine whether or not they are on the correct path in regard to their experiments or research. The best technical feedback on company based projects will generally come from the company staff themselves. Students need to approach appropriate staff on a regular basis to determine whether or not what they are doing is meaningful. Although staff may be busy, a polite request may achieve the required outcome:

"…Would you be good enough to tell me when I could have an appointment with you for, say, 10 minutes, in order to show you a summary of my results and analysis. I need someone with hands-on experience to provide me with some feedback as to whether or not the results I am getting are meaningful…"

The regularity of the meetings will require professional judgment on the part of the student. Clearly, if students attempt to get verification of every minor measurement then staff will quickly tire of providing support. A good rule of thumb would be:

- Validate early work to see if it is meaningful before expending large amounts of time on more detailed work.
- Validate trends to see if they are meaningful before conducting detailed analysis.
- Validate analytical approaches.
- Validate results of analysis.

This would mean that students could make around four meetings with technical staff, over the course of a semester project, to check that they are on the correct path.

5. Confidentiality

Students will often be made privy to confidential information regarding a collaborating organisation. This may relate to designs, marketing, production techniques, etc. It may also relate to flaws and inefficiencies in company processes. For example, a company may have a production facility which is not as efficient as it could be. Generally, companies are very sensitive to what information is released about them and to whom it is released. At the start of the project, students should approach company liaison staff up front and get clarification of what can be released:

"…as you are aware, I am a student and I will need to discuss various issues regarding the project with academic staff and colleagues. Could you please advise me on what issues I need to keep in confidence so that I do not inadvertently reveal any sensitive information…"

Confidentiality is also a serious issue in regard to clients and suppliers. A company may not want its suppliers or customers to know anything about internal costings. Students should never approach suppliers or customers/clients without first gaining approval from a company representative, and they should also get clarification on what issues can be discussed with clients and suppliers.

Some students may be asked to sign a confidentiality agreement or a non-disclosure agreement. This is a legally binding agreement between the company and the student. Students should get their own professional advice (preferably legal) before signing such documents as they could have ramifications both for project reporting and for future use of any technologies that they develop.

6. Intellectual Property

Some students may be asked by a company to sign an agreement handing over intellectual property developed by the student to the company. As with confidentiality and non-disclosure agreements, a document handing over intellectual property has significant implications (both short and long term) for the student.

In some cases, the handover of intellectual property may prevent a student from doing similar work for other companies later in their career. Students should not sign intellectual property transfers unless they have taken external advice from informed professionals on the implications of the agreement.

In some cases the university and the company will have signed an intellectual property agreement and the student will be asked to sign an agreement with the university before commencing a project. Again, students should not sign any such legal documents (even with the university) unless they have received professional advice on the subject.

5. Resolution of Problems

From time to time it is inevitable that problems will arise during the conduct of projects. These generally relate to:

- The relationship between the student and company staff.
- Differences in opinion on how the project should proceed.
- Resourcing issues.
- Performance issues.
- Other personal or health issues.

When such problems arise, it is important that students contact their university/academic supervisor as soon as practical and discuss the matter with them. If a satisfactory conclusion can not be reached with the academic supervisor, then students should take the matter up with their student representative groups within the university.

7. Safety

Student safety and welfare is of paramount importance whether students are university or at a collaborating organisation. In the case of industry based projects, students have to deal with both safety issues relating to university laboratory use and issues related to the company work environment.

If students ever feel that their safety, physical or mental well-being is affected by any aspects of an industry project, they should report the matter immediately to:

- Company safety representatives if the incident is on company premises
- Their academic supervisor and/or university occupational health and safety representatives, if the incident is at the university or even company premises.

Safety, physical and mental well-being must always take priority over any issues related to project work. If a collaborating organisation is not willing to act on a safety threat to students, then the students should leave the company premises immediately and seek guidance from university/academic supervisors.

Additionally, students are not required to endure abuse or mistreatment from any company staff. Students who are not able to deal with such issues should make it clear to company representatives that they are not prepared to tolerate such behaviour:

"…I'm sorry. I am not required to tolerate this behaviour. I am therefore terminating this discussion and will be leaving immediately to confer with my academic supervisors. We will give you a formal response as soon as practical."

8. Concluding the Relationship

Students need to ensure that their relationship with a collaborating organisation ends on a positive note. Specifically, the following closure items need attention:

- Deliverable items handed over to collaborator as per agreement.
- Final reports and presentations provided to collaborator as per initial project agreement.
- Formal and informal thanks given to all staff in the collaborating organisation who provided assistance or support.