

Ivor's Experience Collaboration with Industry

I. My Research Plan

I had joined the Government Laboratory straight from school and having studied for two years at evening classes, gained entry qualifications for university. I was successful in the competition for a bursary and studied for a degree in applied science, ultimately gaining a good honours degree. My degree course was a four-year sandwich course consisting of six months of each year at college and six months on a minor research project at the Laboratory. During the four years I gained experience in four major areas of scientific work.

During the third industrial period I had worked with a Dr Miller on some very exciting problems. He was a very capable scientist and I enjoyed working with him. Sadly, by the time I had completed my degree Dr Miller had moved to another laboratory.

I was still more interested in the work I had been doing with him than with anything else and managed to be allowed to return to that division of the Laboratory. The particular task I was given, while vaguely similar, was essentially in a field about which I knew very little but was within the speciality of the Reader at the University, Dr James, who had supervised the research project that had formed a significant part of my final degree.

In the heady atmosphere following a degree and in an environment where one was surrounded by people with doctorates my enthusiasm to undertake a doctorate was considerable. Both the University and the Laboratory were amenable to the idea of a joint activity, using a new analytical apparatus at the Laboratory and a set of instrumentation built at the university by a previous PhD student.

So I accepted the offer of a place to work for a PhD, registered part-time. The Laboratory continued to pay my salary while I paid the fees.

Q 1. Identify the main problems that can arise in this kind of collaboration.

Q 2. List the issues that should be clarified at this stage.

2. First problems

The first problems arose almost immediately. It was a new field to me and I had no background in it. It was not a field that had been introduced at all during my degree studies. In fact was in a different scientific discipline. The new apparatus at the Laboratory was copied from a research system developed at another university. Apart from the extreme subtlety of its use, it required a special x-ray generator. Such an x-ray machine was purchased but proved to be exceedingly unreliable. It would work for maybe an hour then require to be stripped down before it would work again. This could take a whole day to achieve.

The equipment at the University did not work either. It relied on a very high quality filter unit which had been built by the previous student. With the assistance of the electronics expert at the Laboratory I tried to test it but it did not appear to work. We accordingly opened it up and found it was such a mess inside that it was really highly questionable whether it could ever have worked. I was told that I had to build a completely new one myself.

Q 1. Discuss the problems that have arisen.

Q 2. What should Ivor do now?

3. Mutual Credibility

The new Laboratory apparatus had been designed to study non-metallic crystals and the entire research project was based on the intention of analysing particularly difficult metal crystals. There was no previous knowledge of whether it would be possible to investigate the particular metal crystals with this apparatus. If anyone had any doubts about it I was not told of them. I spent two weeks with the inventor of the equipment learning how to use it. With non-metallic crystals it was not particularly difficult to get good results. With the metal I had to work with, problems due to the nature of the way it was produced overwhelmed the system and it was not possible to obtain comparable results. This, I was told, was considered to be my failing.

Q 1. Discuss the problems that have now arisen.

Q 2. What should Ivor do about them?

4. Supervision

Senior people at the Laboratory were convinced that the University equipment could not produce any meaningful information. It was a technique they had no experience of and therefore did not believe in it. Equally, the people at the University had no confidence in the apparatus I was to be using at the Laboratory.

There was never any concept of joint supervision for this research project. The University and the Laboratory only monitored what I did on their own premises. There was no-one to go to who could really sit back and consider the whole problem. Both parties really put pressure on me in the apparent conviction that the difficulties and problems were entirely due to my lack of skill. Each was convinced of the correctness of their position.

What could I do about them? To opt out of either was virtually impossible. To say the University equipment could not be used was to presume that I was incapable - after all the previous student had got good results from it. (...or did he?) It was by then obvious to me that to even use it for my work the entire system would have to be redesigned and rebuilt! Hence the end of any chance of a PhD. On the other hand, to claim that the Laboratory side of things was impossible was inconceivable. It would have been the loss of my job.

Q 1. What responsibilities has the academic supervisor in this situation?

Q 2. What should Ivor do now?

5. From PhD to Masters?

After some eighteen months of this, I had had enough. Both the Laboratory and the University people said that "everyone knows research for a doctorate is hell. You must just get down to it and make it work". The University were pressing me for fees which I did not have the money to pay. At length they suggested that I write up what I had done and submit as for a Masters degree.

There was at that stage nothing new in what I had done. I had really only been trying to mend and coax problem equipment to work with but very poor results to my labours. By now everything new about the various techniques had already been published elsewhere by others. I wrote up what I had, but the nature of the subject was woefully short of relevant references. This University demanded references, and in the end my supervisor thought they could offer me some. It cost me a lot of money to get them from other libraries, but, when I read them, they had no connection with my endeavours at all.

Q 1. Discuss the supervisor's advice.

Q 2. What should Ivor do now?

6. A Tempting Offer

During my second year of this research, a Reader from a different university visited the Laboratory. He was just setting up a research facility in the exact territory of my research and actually offered me a Post Doctoral Research Fellowship based on a conversation about my work. That was if I could find somewhere to accept my "thesis" so far.....

Q 1. Comment on the options available to Ivor.

Q 2. Which should Ivor choose?

7. Conclusion

Much cheered by this, I contacted the Reader and was invited to visit his university and meet the other members of his new group. I was made very welcome and they were keen to have me join them...but they could not contemplate accepting any thesis from someone who had not been registered with them as a doctorate student. They suggested I contact other universities to find one who would be prepared to accept a thesis but this seemed to be a wild goose chase. It was by now obvious that there was no university that would not be willing to accept any kind of thesis from me. I had also come to hate the entire subject.

Unable to produce a thesis of any kind that could find favour with either the Laboratory or the University, I withdrew my registration from the university and resigned from the Laboratory. The University eventually stopped trying to prise money out of me. The Laboratory asked that I provide them with a fully detailed report of everything I had done and attempted. This took a great deal of perseverance under conditions of extreme stress and when I gave it to the Group Head to have it typed he refused saying it was not the sort of thing they would be prepared to do. (Pardon me for living.....)

That time was about the worst part of my life. I am well aware of my personal limitations, especially at that time, but had things been structured in a different way, it should have been possible to make something work.

In retrospect I should not have got involved with the project at all. The research for my degree project had been on non-metallic crystals and had almost been accepted for publication in the Journal of the Royal Society, which is the pinnacle of achievement one might hope to aspire to when one had really been successful. Metallic crystals meant nothing to me but from an employment position in the Laboratory that was all that was going and I had had to accept it or nothing. Consequently they perhaps tolerated the idea of a member of staff engaging in an external doctorate project rather than supporting it. In that sense they had to provide lip service to the government policy to encourage such things. I now believe that they had already decided that there was no more to be done on that metal when they let me start the project.

Q 1. Had Ivor a legitimate complaint against the University?

Q 2. If so, list the main elements of such a complaint.

8. The Aftermath

As an embryo researcher, one desperately needs a mentor to help one to acquire the essential understanding of the field. Without that one perhaps can never know that one really knows the subject. I left the government Laboratory moving first to a small organisation and then to a large technical company. During the ten years I was there I became responsible for a number of small applied research activities in a wide variety of technical areas. I have been invited to present papers on his work to ten international conferences and have authored a number of articles in learned journals.

I feel that my experience highlights the supreme importance of establishing clear guidelines at the beginning of one's postgraduate career. In an ideal world, my research situation should have enabled me to achieve a research degree. Instead, everyone around me, rather than assisting the situation that was proving exceedingly difficult, turned it against me. With such wreckage it is not easy to restart a career in another organisation and one can never make up for the lost time in the promotion stakes. The responsibility taken by supervisors at this stage of a young person's career can make or ruin the student's future life.

Team Task:

On the acetate provided list the main guidelines for supervisors and departments considering collaborating with industry in the development of post-graduate research programmes.