# Employability Skills In Physics

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## Abstract

*Graduate employability is an important issue for higher education as the global financial crisis has led to a significant decline in the employment prospects of new graduates over the past few years. This issue is additionally important due to the reported dissatisfaction of many employers with graduates' ability to contribute effectively to the workplace. The Graduate Employability for Science (GEMS) Project seeks to address these problems by exploring the skills needs of recent science graduates and their employers and, importantly, designing interventions that will inculcate such skills and attributes into undergraduate students via the curricula. This paper presents some Major knowledge and skill for physics graduates.*

**Keywords:** graduate employability, science graduate , generic skills.

## EMPLOYABILITY SKILLS IN PHYSICS

### EMPLOYABILITY SKILL FOR PHYSICS GRADUATES

Graduates from the physical sciences usually find that their skills are much sought after in the employment market, whether they remain within their subject discipline, or move into unrelated areas. However, as participation in higher education continues to increase, new graduates may find the employment market more competitive. Consequently, students will need to be confident that their investment in higher education, and the associated debt, will be of benefit to them and they may be influenced in their choice of institution and subject by the career prospects on graduation. The growth of student numbers in some disciplines in HE, such as

business and media related degrees, has not been evident in the physical sciences. Recruitment to physical science departments may be enhanced if we take a proactive approach to developing the employability of our graduates and provide relevant careers advice.

Most colleagues are aware of the key skills that employers seek when recruiting new graduates. These include,

- Teamwork
- Problem solving
- C & IT Skills
- Oral and written communication
- Analytical and critical thinking

Although development of these key skills is well embedded in most courses, students often fail to value them or to relate them to an employment context. New initiatives place increased emphasis on encouraging students to relate these essential skills to their future employment. Academics can help students to do this by embedding skills development activities that are clearly employment orientated.

Work placements are a valuable way of helping students to develop work related skills and are highly regarded by potential employers. Those students unable to secure a work placement can be disadvantaged when competing with those who have undertaken placements. Even those students returning from an industrial placement may have gained variable experience due to the wide diversity in the placement experience. Therefore, the provision of department-based activities designed to develop employability skills and career awareness can be justified for all students.

## EMPLOYABILITY SKILLS COVER THE FOLLOWING AREAS:

- Developing key transferable skills
- Planning and personal development skills
- Career planning and gaining employment
- Successfully contributing to the role once acquired
- Continuing to develop within a career throughout their working lifetime

Helping students to develop employability skills This practice guide contains some examples of good practice in developing employability skills that are already taking place within departments. The majority of these activities are fully transferable to a physical science context.

## AREAS OF KNOWLEDGE AND SKILLS IMPORTANT FOR EMPLOYABILITY FOR PHYSICS

1. Content knowledge in your disciplinary area (e.g., content knowledge of chemistry)
2. Ability to apply knowledge and skills relevant to your disciplinary area
3. Ability to explain the role and relevance of science in society
4. Research skills (e.g., planning and design of experiments)
5. Appreciation of ethical scientific behaviour
6. Technical analysis
7. Knowledge/appreciation/awareness of business/commerce/ industry
8. Mathematical skills (numeracy/quantitative skills)
9. Information and communication technology (ICT) skills
10. Analytical and critical thinking skills
11. Problem solving skills
12. Report writing and/or written communication skills
13. Oral presentation and/or verbal communication skills
14. Ability to retrieve/locate information from a range of sources
15. Leadership skills
16. Team working skills
17. Time management and organisational skills
18. A capacity for flexibility or adaptability
19. Ability to use own initiative
20. Independent learning ability required for continuing professional development.

## MAJOR SKILLS FOR PHYSICS GRADUATES

**1. Communication:** Depending on the job, communication is

about being a good talker or a good writer. It involves being confident about speaking to people (face-to-face or over the phone). It also involves writing well enough to be understood in emails and memos.

Examples of ways that you can develop or improve your communication skills include:

- writing assignments and reports as part of your studies
- blogging or using social media
- making oral presentations as part of your class work
- working in customer service (face-to-face or on the phone)
- Volunteering to host a community radio program.

**2. Team work :** Teamwork means being good at working with people - both the people you work with and other people that come into contact with your organization.

Examples of ways that you can develop or improve your teamwork skills include:

- doing group assignments as part of your studies
- volunteering for a community organization
- thinking about how you can work better with other people at your workplace
- Joining a local sporting team.

**3. Problem solving:** Problem solving is about being able to find solutions when faced with difficulties or setbacks. Even if you can't think of a solution straight away, you need to have a logical process for figuring things out.

Examples of ways you can develop or improve your problem solving skills include:

- doing research assignments as part of your studies
- dealing with complaints at your workplace
- doing a study skills course that looks at problem solving
- talking to other people about how they solved the problems they faced.

**4. Initiative and enterprise:** Initiative and enterprise are about being able to think creatively and to make improvements to the way things are. They're also about looking at the bigger picture

and how the way you work fits into that.

Examples of ways you can develop or improve your initiative and enterprise skills include:

- approaching organisations and businesses about work placements or internships
- setting up a fundraiser in your community
- making or proposing changes to the way a group you belong to does things.

**5. Planning and organizing:** Planning and organizing are about things like working out what is required to get a job done, and then working out when and how you'll do it. They're also about things like developing project timelines and meeting deadlines.

Examples of ways you can develop or improve your planning and organising skills include:

- developing a study timetable and sticking to it
- organising some independent travel
- managing your time around work, study and family commitments
- helping to organise a community event
- doing chores regularly around your home.

**6. Self-management:** Self-management is about getting on with your work without someone having to check up on you every five minutes. You should also be able to stay on top of your own deadlines and be able to delegate tasks to other people to make sure things get done on time.

Examples of ways that you can develop or improve your self-management skills include:

- doing a work experience placement or internship
- asking for new responsibilities at work
- developing a study schedule and sticking to it
- joining a volunteer organisation.

**7. Learning:** Learning about wants to understand new things and being able to pick them up quickly. It's also about being able to take on new tasks and to adapt when the way things are done in the workplace change.

Examples of ways to develop or improve your learning skills include:

- doing a short course or online course
- doing some research into learning skills and learner types
- starting a new hobby
- Joining a sporting or volunteer group.

**8. Technology:** General technology skills that employers want include things like being able to use a computer for word processing and sending email, or knowing how to use a photocopier. Some more specific technology skills relate to software, like using social media, working with design or video editing software or knowing programming languages. Other technology skills relate to hardware, like knowing how to use EFTPOS, a cash register, a photocopier or scanner, a camera or a recording studio.

Examples of ways to develop or improve your technology skills include:

- doing a short course or online course
- asking for extra training at work
- finding out what technology is used in the job you want and researching its use
- identifying the technology you're already using in your day-to-day life

## Discussion and Conclusion

In this paper how generic skills are valued by science graduates and employers from science-based sectors and how the university could do more in preparing its graduates for employment. By understanding the employers' needs on the generic attributes, lecturers can play a more effective role in embedding the desired attributes into curriculum. This will help graduates to improve their employability based on the employers' needs and consequently, increases the employment rate among physics graduates.

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