



Employability Guide

Physics Subject Centre: Student Employability Profile

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Built Environment
Economics
Engineering
English
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Health Sciences and Practice
Materials
Mathematics, Statistics and OR
Philosophical and Religious Studies
Physical Sciences
Psychology

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The approach adopted for the project was to respond to Subject Centre specific needs and perspectives in line with ESECT guidance.

In compiling the profiles, we drew on the subject benchmark statements developed and maintained by UK higher education academic communities and copyright by the Quality Assurance Agency for Higher Education (QAA). We also took account of the input from the CIHE Employer membership regarding competencies, skills and attributes they valued when recruiting, this information was gathered during the first phase of this work in 2002, further details can be found on the CIHE website.

We also drew on the work of:

Professor Lee Harvey, Centre for Research and Evaluation Sheffield Hallam University
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Professor Stephen McNair, Higher Education Adviser, Department for Education and Skills

Further Links

AGCAS	http://www.agcas.org.uk/
AGR	http://www.agr.org.uk/
CIHE	http://www.cihe-uk.com/
ESECT	http://www.hefce.ac.uk/learning/tinits/esect/
Higher Education Academy	http://www.heacademy.ac.uk/
LTSN	http://www.ltsn.ac.uk/home.asp
SSDA	http://www.ssda.org.uk/



STUDENT EMPLOYABILITY PROFILES

PHYSICS

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STUDENT EMPLOYABILITY PROFILES

PHYSICS

1. INTRODUCTION

For most higher education students, employability on graduation and over the long term is a major priority. More and more higher education courses provide the means for students to develop their employability skills, to raise their own awareness of these skills and to increase their ability to articulate these skills. Such capabilities can be put into practice in personal development planning, work experience opportunities, job searching, interviews and similar situations and be of real help when making major career and life changes.

The underlying assumption is that a student's life long learning capability and employability can be enhanced through their higher education experience without detrimental impact on their academic study. The impact of the effects of widening participation in higher education, along with greater diversity in the ways in which students learn, provides a climate where increased numbers of students can and need to benefit from supported development of their employability skills.

Student employability profiles have been created which indicate the skills that typically can be developed through the study of particular subjects. The profiles are for use by Subject Centre staff in support of their academic communities' promotion of employability skills development, to the benefit of current and prospective students and employers alike.

2. RATIONALE

- Pre university students can be influenced heavily by stereotype impressions of a subject (too hard, too theoretical, not taught at A level, does not lead to a job, only leads to a narrow range of jobs etc.) and this can skew applications away from subjects that may well suit study.
- Pressures and short term considerations mean that many undergraduates face a challenge in committing to personal skills development.
- On graduation, a significant percentage of students in many subjects choose careers not related to their course of study and a knowledge of their own employability skills can facilitate transition.
- Some 60% of graduates leave their first job after less than three years and this suggests that improvements in matching graduates to first jobs might reduce the incidence of initial wrong choices.

3. APPLICATION

Whilst it is for the Subject Centres and their communities to determine how a profile may be applied, it is envisaged that it may support existing initiatives in promoting a subject to pre university students, stimulating undergraduate skills learning, preparing students for work experience, and supporting job searching on graduation. This may in turn have a benign effect on the number and type of students applying to study a subject, on undergraduate skills learning, on motivation to study and on better discussions and negotiations with employers for work experience and job opportunities. So the areas for application may include:

- Schools careers.
- Undergraduate learning.
- Departmental and student links with employers.

4. EMPLOYABILITY SKILLS PROFILES

The employability skills profile for this subject can be used generically as support material in the applications mentioned. It can also be used as a tool to help an individual student identify examples of their own skills development through reviewing the list of possible skills identified by the Subject Centre from the benchmark statement for their subject and from other sources. Students may then map their own examples against the list of qualities and attributes typically sought by employers, so enabling the evidencing of skills to be interpreted in language helpful to employers.

5. PHYSICS - EMPLOYABILITY SKILLS

The **specific** employability skills that can be gained by studying Physics, as identified by the Quality Assurance Agency (QAA) Subject Benchmark Statements, are::

- Knowledge and understanding of most fundamental physical laws and principles, and develop competence in the application of these principles to diverse areas of physics;
- Formulate and tackle problems in physics by identifying the appropriate physical principles, using science techniques such as special and limiting cases and order-of-magnitude estimates to guide thinking about a problem;
- Present problem solutions by making assumptions and approximations explicit. Develop the ability to identify relevant principles and laws of physics when dealing with problems;
- Plan, carry out, analyse and report the results of an experiment or investigation;

- Use appropriate methods to analyse the data produced and evaluate the level of uncertainty in the results, compare these results with expected outcomes, relate any conclusions to current theories of the physics involved and theoretical predictions or published data, and assess their significance;
- Use mathematics to describe the physical world;
- Develop an understanding of mathematical modeling and of the role of approximation in order to compare critically the results of model calculations with those from experiment and observation;
- Physics degree programmes involve the solving of problems with well-defined solutions as well as tackling open-ended problems. This develops the ability to formulate problems in precise terms and to identify key issues. Students will develop the confidence to try different approaches in order to make progress on challenging problems.
- Develop skills of independent investigation through using textbooks, and other available literature, searching databases and interacting with colleagues/peers to extract important information.
- Physics and the mathematics used in physics deal with surprising ideas and difficult concepts therefore good communication is essential, the ability to listen carefully, to read demanding texts, and to present complex information in a clear and concise manner is essential.
- Paying attention to detail and to developing the ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly are skills developed through the study of physics.
- Develop computing and IT skills in a variety of ways, including the ability to use appropriate software such as programming languages and packages. Display competent use of appropriate IT packages/systems for the analysis of data and the retrieval of appropriate information;
- Develop the ability to work independently, to use initiative, plan and organise to meet deadlines, and interact constructively with other people.
- Develop an ability in numerical manipulation and the ability to present and interpret information graphically;
- Communicate scientific information, in particular through scientific reports. Solve problems in physics using appropriate mathematical tools. Identify the relevant physical principles and make approximations necessary to obtain solutions. In particular, produce clear and accurate scientific reports.
- Manage own learning and make use of appropriate texts and learning materials, research-based materials or other learning resources;

- Display sound familiarity with laboratory apparatus and techniques if on experimental programmes.
- Execute and analyse critically the results of an experiment or investigation and draw valid conclusions;
- Evaluate the level of uncertainty in experiment results and compare these results with expected outcomes, theoretical predictions or with published data. Evaluate the significance of the results in this context.

6. EMPLOYERS' CRITERIA

Employers have identified the attributes they seek in the graduates they recruit. The qualities or attributes used here have been identified and categorised by employer members of the Policy Forum of the Council for Industry and Higher Education. They are the key components they have observed in those individuals who can transform organisations and add value early in their careers (see the report *Graduates Work* by Professor Lee Harvey, CIHE 2001) and comprise:

- **Cognitive Skills/Brainpower:** The ability to identify and solve problems; work with information and handle a mass of diverse data, assess risk and draw conclusions.
- **Generic Competencies:** High-level and transferable key skills such as the ability to work with others in a team, communicate, persuade and have interpersonal sensitivity.
- **Personal Capabilities:** The ability and desire to learn for oneself and improve one's self awareness and performance. To be a self starter (creativity, decisiveness, initiative) and to finish the job (flexibility, adaptability, tolerance to stress).
- **Technical Ability:** For example, having the knowledge and experience of working with relevant modern laboratory equipment.
- **Business and / or Organisation Awareness:** An appreciation of how businesses operate through having had (preferably relevant) work experience.
- **Practical Elements - Vocational Courses:** Critical evaluation of the outcomes of professional practice; reflect and review own practice; participate in and review quality control processes and risk management.

An individual student may identify examples of their own skills development during the course of study and may map these against the list of attributes and qualities typically desired by employers, so enabling the student to translate their learning experiences into language helpful to employers.

7. Template

Physics is not simply a discipline for the training of scientific personnel, but is at the core of our intellectual understanding of all aspects of nature and is the foundation of many of the sciences. The template seeks to capture key behavioural indicators or criteria identified within the subject benchmark statements. It cross references these with the competencies identified by members of the Council for Industry and Higher Education (CIHE) Employers Forum as being the attributes/qualities that are the key components they have observed in those individuals who can transform organisations and add value early in their careers (see the report *Graduates Work* by Professor Lee Harvey, CIHE 2001).

This template depicts figuratively the linkage between the subject's own selected employability skills and the list of employers' employability criteria.

STUDENT EMPLOYABILITY PROFILE - GENERIC TEMPLATE: Physics, astronomy and astrophysics

GENERIC EMPLOYABILITY COMPETENCIES



	Cognitive Skills	Generic Competencies	Personal Capabilities	Technical Ability	Business and / or Organisation Awareness	Practical and Professional Elements
Subject Benchmark Indicators:	The ability to identify, and solve problems, work with information and handle a mass of diverse data, assess risk and draw conclusions.	High level and transferable key skills such as the ability to work with others in a team, communicate, persuade and have interpersonal sensitivity.	The ability and desire to learn for oneself and improve ones self-awareness, emotional intelligence and performance. To be a self-starter (creativity, decisiveness, initiative) and to finish the job (flexibility, adaptability, tolerance to stress).	For example, having the knowledge and experience of working with relevant modern technology.	An appreciation of how businesses operate through having had (preferably relevant) work experience. Appreciation of organisational culture, policies and processes.	Critical evaluation of the outcomes of professional practice, reflect and review own practice, participate in and review quality control processes and risk management.

	Cognitive Skills	Generic Competencies	Personal Capabilities	Technical Ability	Business and / or Organisation Awareness	Practical and Professional Elements
<p>Knowledge and understanding of most fundamental physical laws and principles, and develop competence in the application of these principles to diverse areas of physics. Formulate and tackle problems in physics by identifying the appropriate physical principles, using science techniques such as special and limiting cases and order-of-magnitude estimates to guide thinking about a problem.</p>	<p>Analysis, judgement, attention to detail, planning and organising.</p>		<p>Initiative.</p>	<p>Technical ability, technical knowledge.</p>		<p>Professional expertise.</p>
<p>Present problem solutions by making assumptions and approximations explicit. Develop the ability to identify relevant principles and laws of physics when dealing with problems.</p>	<p>Analysis, judgement, attention to detail, planning and organising, decisiveness.</p>		<p>Initiative, achievement orientation.</p>	<p>Technical ability, technical knowledge.</p>		<p>Professional expertise.</p>
<p>Plan, carry out, analyse and report the results of an experiment or investigation. Use appropriate methods to analyse the data produced and evaluate the level of uncertainty in the results, compare these results with expected outcomes, relate any conclusions to current theories of the physics involved and theoretical predictions or published data, and assess their significance.</p>	<p>Analysis, judgement, attention to detail, planning and organising.</p>			<p>Technical ability, technical knowledge.</p>	<p>Process operation.</p>	<p>Professional expertise.</p>

	Cognitive Skills	Generic Competencies	Personal Capabilities	Technical Ability	Business and / or Organisation Awareness	Practical and Professional Elements
Use mathematics to describe the physical world. Develop an understanding of mathematical modelling and of the role of approximation in order to compare critically the results of model calculations with those from experiment and observation.	Analysis, judgement, attention to detail, decisiveness.			Technical ability, technical knowledge.	Process operation.	
Physics degree programmes involve the solving of problems with well-defined solutions as well as tackling open-ended problems. This develops the ability to formulate problems in precise terms and to identify key issues. Students will develop the confidence to try different approaches in order to make progress on challenging problems.	Analysis, judgement, attention to detail.		Initiative, achievement orientation.			
Develop skills of independent investigation through using textbooks, and other available literature, searching databases and interacting with colleagues/peers to extract important information.	Analysis, judgement, attention to detail.	Interpersonal sensitivity, working with others.	Achievement orientation.	Technical ability, technical knowledge.		

	Cognitive Skills	Generic Competencies	Personal Capabilities	Technical Ability	Business and / or Organisation Awareness	Practical and Professional Elements
Physics and the mathematics used in physics deal with surprising ideas and difficult concepts therefore good communication is essential, the ability to listen carefully, to read demanding texts, and to present complex information in a clear and concise manner is essential.		Listening, written communication, working with others.	Creativity.	Technical ability, technical knowledge.		Professional expertise.
Paying attention to detail and to developing the ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly are skills developed through the study of physics.	Analysis, judgement, attention to detail.	Influencing.	Initiative.	Technical ability, technical knowledge.	Process operation.	Professional expertise.
Develop computing and IT skills in a variety of ways, including the ability to use appropriate software such as programming languages and packages. Display competent use of appropriate IT packages/systems for the analysis of data and the retrieval of appropriate information.	Attention to detail.		Initiative.	Technical ability, technical knowledge.		Professional expertise.
Develop the ability to work independently, to use initiative, plan and organise to meet deadlines, and interact constructively with other people.	Planning and organising.	Interpersonal sensitivity, working with others, teamwork.	Adaptability, flexibility.			

	Cognitive Skills	Generic Competencies	Personal Capabilities	Technical Ability	Business and / or Organisation Awareness	Practical and Professional Elements
Develop an ability in numerical manipulation and the ability to present and interpret information graphically.	Analysis, judgement, attention to detail.	Written communication.		Technical ability, technical knowledge.		Professional expertise.
Communicate scientific information, in particular through scientific reports. Solve problems in physics using appropriate mathematical tools. Identify the relevant physical principles and make approximations necessary to obtain solutions. In particular, produce clear and accurate scientific reports.	Analysis, judgement, planning and organising.	Interpersonal sensitivity, written communication.		Technical ability, technical knowledge.		Professional expertise.
Manage own learning and make use of appropriate texts and learning materials, research-based materials or other learning resources.	Planning and organising.		Personal development.	Technical ability, technical knowledge.		Professional expertise.
Display sound familiarity with laboratory apparatus and techniques if on experimental programmes.				Technical ability, Technical Knowledge.		

	Cognitive Skills	Generic Competencies	Personal Capabilities	Technical Ability	Business and / or Organisation Awareness	Practical and Professional Elements
Execute and analyse critically the results of an experiment or investigation and draw valid conclusions. Evaluate the level of uncertainty in experiment results and compare these results with expected outcomes, theoretical predictions or with published data. Evaluate the significance of the results in this context.	Analysis, judgement, attention to detail, planning and organising.	Written communication.	Initiative.	Technical ability, technical knowledge.	Process operation.	Professional expertise.
Professional Factors						
Employment						
Work Experience						

8. REFLECTIVE QUESTIONS

Raising self-awareness is a prerequisite to building up life long learning capabilities. Many courses have key points during study when students are tasked with reflecting on and evidencing their achievements. The results can be fed into the writing of CVs and Progress Files. The following questions may be used by students, guided by tutors or lecturers, to help with reflection and evidencing. Students should also be encouraged to consider any work experience and or voluntary and extracurricular activities.

Students may use these questions in conjunction with the template when reflecting on skill development and undertaking personal development planning (PDP). The list is not exhaustive; it is designed to stimulate the student to reflect on the skills that they are practicing, to raise self-awareness and the ability to articulate these skills. Using this approach will also help students become familiar with competency based interviewing and assessment.

ACHIEVEMENT ORIENTATION - *Maintains and inspires a results-driven approach, focuses on results and critical performance indicators.*

- Recall an important goal that you were set in the past. What strategies did you use to achieve it? What was successful?
- How do you meet tight deadlines?
- Thinking about a difficult task you were required to undertake, what extra effort did you exert to achieve the goals set and accomplish a task?
- Thinking about a time when you did not achieve a goal or meet a deadline, what did you do? What was the outcome?
- Can you recall a time when you were particularly effective on prioritising tasks and completing a project on schedule? How did you approach this and what was the outcome? What did you learn?
- Describe a project or idea that was implemented primarily because of your efforts. What was your role? What was the outcome?
- There are times when we work without close supervision or support to get the job done, think about a time when you found yourself in such a situation. What did you do? What was the outcome?

ADAPTABILITY / FLEXIBILITY - *Maintains effectiveness in a changing environment.*

- Consider a time when you had to adopt a new approach or style to accomplish a task. How did you manage the transition?
- Think about a situation in which you had to adjust to a colleague's working style in order to complete a project or reach your objectives. What did you do?
- What do you do when priorities change quickly? Thinking about an example of when this happened, what did you do? What was the outcome?
- Consider an example of an important goal that you set yourself in the past. Thinking about your success in reaching it, how did you approach it?
- Reflect on a situation in which you had to adjust to changes over which you had no control. How did you handle it?

- What tends to work with one person does not necessarily work with another. Think about a time when you had to be flexible in your style of relating to others. How did you vary your communication style with a particular individual? What was the result?

ANALYSIS - *Relates and compares data from different sources, identifying issues, securing relevant information and identifying relationships.*

- When you have to analyse information and make a recommendation, what kind of thought process do you go through? What is your reasoning behind your decision?
- How do you ensure you have captured the key information from written or verbal information presented to you?
- What are your considerations when presenting a solution to a work issue?
- When presented with a problem, how do you go about finding a resolution?
- How do you deal with data from a variety of sources, to identify the key information?
- How would you identify appropriate data sources to inform your decisions?
- When presented with several points of view what do you do to ensure you reach the most appropriate conclusion?
- How do you distinguish between different types of information provided to inform your conclusions?

ATTENTION TO DETAIL - *Accomplishes tasks through a concern for all areas involved, no matter how small.*

- How do you deal with minor considerations as part of a bigger task?
- What level of feedback do you request from others on ideas or suggestion you have for a project?
- What checks do you put in place to ensure written work is correct?
- How do you ensure the facts that you have are correct and complete?
- When undertaking a specific project or task, how do you ensure details are not overlooked?

COMMERCIAL AWARENESS - *Understands the economics of the business. Understands the business benefits and commercial realities from all stakeholder perspectives (customer, supplier, employer, employee, shareholder etc.).*

- Consider a commercial activity you have been involved in, either paid work, voluntary work, participating in fundraising and so on. Think about the issues you have come across and how these might influence the wider activity. Do you look at this from one perspective, e.g. monetary, or do you take other elements into account such as marketing and selling and how these influence each other?
- When considering economic issues, do you consider business implications such as increased revenue/profit, decreased expenditure, increased productivity, and improved company image and market share?
- Have you ever identified a business opportunity? How did you go about it? What did you consider?
- How would you go about developing a business plan for e.g. getting a job? Do you consider the commercial constraints that might be applied when looking at salary?

- Do you analyse financial trends (e.g. income, spend, surplus, deficit) and forecast accordingly when setting your personal budget?

CREATIVITY – *Generates and/or recognises how best practice and imaginative ideas can be applied to different situations.*

- Think about a problem that you have solved in a unique or unusual way. What was the outcome? Were you satisfied with it?
- When presented with a variety of different scenarios, what is your preferred course of action?
- How do you approach a conventional task?
- How do you attempt to break deadlock situations?
- We sometimes fail to consider new ideas because they seem untried and/or untested. Describe a time when you found yourself in a situation similar to this. What happened?
- What do you do to encourage self / others to think laterally and to generate ideas?
- How do you present an idea that you know may be considered unusual to your family / friends / lecturers / manager?
- Think about the most significant or creative presentation which you have had to complete. How did you approach it? What was the result?

DECISIVENESS - *Makes decisions and takes action.*

- When making a controversial decision how do you deal with criticism?
- How do you feel about making work commitments on behalf of other people?
- What do you do when something needs to be done but no one is there to give you guidance?
- How do you go about getting agreement to a new idea?
- How do you make a decision based on incomplete information?
- Whose needs are most important in the decision making process? How do you decide?

FINANCIAL AWARENESS – *Understands basic financial terminology used in organisations and is able to construct and maintain simple financial records.*

- How do you plan the costs of a project or activity?
- What financial aspects do you consider when setting up a project/activity? How do you measure that you are on target?
- How do you know what financial expectations/demands might be made in the life cycle of a project/activity?
- How might you control over or under spending on a project/activity?
- How do you go about managing your personal finances?

IMAGE - *Presents a strong, professional, positive image to others at all times. This image is consistent with all people (colleagues, management and peers, customers etc.).*

- How do you present yourself when meeting people for the first time? What do you pay special attention to?
- How do you introduce yourself in social gatherings or new and different situations?
- What do you do to ensure people listen to your ideas?
- What do you reflect on at the end of the working day? Do you spend more time on what went well and why, or do you analyse the problems that occurred?
- How would the people you work with/your friends, describe you?
- How do you know when your boss and / or friends value your contribution?

INFLUENCING - *Influences others by expressing self effectively in a group and in one to one situations.*

- Describe a time when you were able to convince a sceptical or resistant person to purchase a product or use your skills?
- Think about a specific instance in which you were able to encourage others to take a chance with a new idea or project. What did you do?
- Describe a situation in which you were able to positively influence the actions of others in a desired direction. How did you approach it? What happened?
- Consider a time when you used your leadership ability to gain support for what initially had strong opposition. What was the outcome?

INITIATIVE - *Identifies opportunities and is pro-active in putting forward ideas and potential solutions.*

- What was the best idea that you came up with in your studies? How did you apply it? What was the result?
- Think about the last time that you undertook a project that demanded a lot of initiative. How did you approach it? What was the outcome?
- Recall a time when you had to use your verbal communication skills in order to get a point across that was important to you. How did you plan for this? What was the result?

INTERPERSONAL SENSITIVITY - *Recognises and respects different perspectives and appreciates the benefits of being open to the ideas and views of others.*

- It is sometimes difficult to form an amicable relationship with new people. Think about an example of how you have coped with such a situation. What did you do?
- Give a specific example of a time when you had to address an angry colleague. What was the problem? What was the outcome? How would you assess your role in defusing the situation?
- Think of an example when you initiated a change in a process or operations in response to feedback. What happened?

- It is very important to build good relationships at work. Consider a time when you built a successful relationship with a difficult person. What did you do? What was the outcome?
- Being successful in a task/activity often depends upon having good relationships with others. Think about a time that you were able to accomplish a task because you had such a relationship with another person. How did this impact your work?
- Consider a time when you built rapport quickly with someone under difficult conditions. What did you do? What was the outcome?
- Consider the key ingredients in developing and maintaining successful formal/business relationships? Think about how you made these work for you. What was the situation? What outcomes did you achieve?

JUDGEMENT - *Determines the most appropriate course of action and draws conclusions that are based on logical assumptions that reflect factual information.*

- What approach do you use to provide a rational solution to a problem?
- How selective are you in the use of relevant, available information?
- When supporting your point of view, what are your key considerations?
- How do you react to complex information when trying to reach a conclusion?
- What information do you take into account before coming to a conclusion?
- What do you do if your course of action is not accepted?
- How do you react to having more than one solution provided to solve an issue?
- What do you do when other people put forward ideas to help solve problems?

LEADERSHIP - *Takes responsibility for the directions and actions of a team.*

- When working on a team project have you ever had an experience where there was strong disagreement among team members? What did you do?
- Describe your leadership style and give an example of a situation when you successfully led a group.
- Think about a time that you had to work on a team that did not get along. What happened? What role did you take? What was the result?
- Think about a time when you were able to build team spirit in a time of low morale.
- Think about a time when you were able to gain commitment from others to really work as a team.
- How have you recognised and rewarded a team player in the past? What was the situation? What did you do?

LIFE LONG LEARNING AND DEVELOPMENT - *Develops the skills and competencies of self, peers and colleagues through learning and development activities related to current and future roles.*

- What have you done outside of formal study to develop your skills?
- Have you created a specific development plan? How did you identify your needs? What were the components of the development plan? What was the outcome?

- There are times when people need extra help. Think about an example of when you were able to provide that support to a person with whom you worked / studied. What did you do? What was the result?
- Think about a time when you had to accept change and make the necessary adjustments to move forward. What were the change / transition skills that you used?
- It is important to maintain a positive attitude at work when you have other things on your mind. Thinking about a situation when you were able to do that, what was the outcome?
- Keeping others informed of your progress / actions helps them feel comfortable. What do you do to keep your lecturer/supervisor advised of the status on projects?
- Think about a time when you took responsibility for an error and were held personally accountable. How did you feel? What did you do?
- When you have been made aware of, or have discovered for yourself, a problem in your work performance, what was your course of action? How did you resolve the situation? What did you learn?
- What have you done to further your own professional development outside of your formal studies?

LISTENING - *Shows by a range of verbal and non-verbal signals that the information being received is understood.*

- How do you ensure people know that you have taken account of their views?
- Think about a time when your active listening skills really paid off for you. What was the situation? What did you achieve?
- What have you done to improve your listening skills?
- Thinking about a situation when you had to present complex information, how did you ensure that the other person understood?
- Think about a recent successful experience in making a speech or presentation. How did you prepare? What obstacles did you face? How did you handle them?
- Consider a time when you were particularly effective in a talk you gave. What was different in making it effective?

ORGANISATION UNDERSTANDING - *Understands the organisation's work environment, internal politics, business objectives and strategy.*

- Describe how you are able to contribute to an organisation's / a job's goals. What are the goals/mission?
- How do you keep your knowledge up to date with the on going changes in the industry you are considering working in?
- Consider a politically complex work situation in which you worked? What did you do?
- How do you ensure you are familiar with the relevant internal processes of an organisation?

ORGANISATIONAL SENSITIVITY - *Is sensitive to the effect of his or her actions on other parts of the organisation and adopts a mature, direct and up front style in dealing with conflict.*

- Consider a time when you made an intentional effort to get to know someone from another culture. What did you do? What was the outcome?
- What have you done to further your knowledge/understanding about diversity? How have you demonstrated your learning?
- Consider how your values and beliefs impacted your relationships with others. How do you know?
- What measures have you taken to make someone feel comfortable in an environment that was obviously uncomfortable with his or her presence?
- Thinking about a time when you had to adapt to a wide variety of people by accepting/understanding their perspective. What was the outcome? What did you learn?
- Consider a situation when you successfully adapted to a culturally different environment. What did you do?
- Think about a specific example of how you have helped create an environment where differences are valued encouraged and supported. What did you do?
- Think about a time when you were particularly perceptive regarding a person's or group's feelings and needs. What did you do? What feedback did you get / seek?
- How have you reacted to conversations between others that were clearly offensive to non-participants? What did you do?
- Think about a time that you evaluated your own beliefs or opinions around issues of difference. What did you do?

PERSONAL DEVELOPMENT - *Maintains an up to date personal development plan and takes action to ensure personal development takes place.*

- How do you record your achievements?
- How do you decide whether a task has gone well or not and what you would do differently next time?
- What activities do you undertake to develop your skills?
- How do you find opportunities to develop your skills and competencies?
- How often do you update your learning log?
- What do you do to gain feedback on your performance?

PLANNING AND ORGANISING - *Establishes a course of action for self and/or others to accomplish a specific goal. Plans proper assignments of personnel and appropriate allocation of resources.*

- How do you typically plan your day to manage your time effectively?
- How do you differentiate and prioritise short and long term needs?
- How do you plan for a meeting to ensure the required outcomes are met?
- What processes do you put in place before starting a project?
- What do you do to manage and monitor an assignment or project to a successful conclusion?

- How do you ensure deadlines you are given, are met? How do you know?
- What processes do you use to achieve tasks and assignments within the required timescale?
- What action do you take to meet changing work priorities that affect others as well as yourself?
- How do you keep track of work schedules and deadlines?

PROCESS OPERATION - *Begins, controls and concludes a complete process or procedure.*

- What do you do to ensure you are familiar with relevant company processes or procedures?
- How do you ensure that you are implementing these in the correct way?
- Why is it important to operate processes and procedures effectively? What might be the impact of not doing this?

PROFESSIONAL EXPERTISE - *Keeps up to date with developments in own areas of professional specialisation. Applies a breadth and/or depth of professional knowledge.*

- What do you do to ensure you are up to date in your area(s) of speciality? How do you ensure that any new information is applied effectively into your work?
- Effectively presents professional information to others.
- When planning, designing and implementing solutions, how do you make best use of your professional knowledge?
- How do you share professional expertise with others?
- What opportunities do you create to demonstrate a knowledge of the latest methodologies and processes in your specialist area?
- Are you or are you planning to be part of a professional network?
- Do you actively seek new people to become part of your professional network?
- Discuss a time when your integrity was challenged. How did you handle it?
- Think about a specific time when you had to handle a tough problem that challenged fairness or ethical issues. What did you do? What was the outcome?
- Think of examples of how you have acted with integrity in your job/work relationships.
- Describe a time when you were asked to keep information confidential. What did you learn about yourself?
- Trust requires personal accountability. Consider a time when you chose to trust someone? What was the outcome?

QUESTIONING - *Uses an appropriate approach to questioning in order to gain information from which to draw conclusions and/or assist in the making of decisions.*

- Because people have different preferences, what works with one person does not necessarily work with another. Consider a situation where you had to be flexible in your style of relating to others in order to achieve your goals. How did you vary your communication style with a particular individual? What happened?

- Think of a situation when you had to use your verbal communication skills in order to gain information that was important to you. How did you approach this? What was the outcome?
- Reflect on a situation when you had to present complex information. How did you ensure that the other person understood?

TEAMWORK / WORKING WITH OTHERS – *Builds and develops appropriate relationships with academic staff, peers, colleagues, customers and suppliers at all levels within an organisation.*

- Think about an example of how you worked effectively with people to accomplish an important result. What did you do? What was the result?
- Consider a situation when you have been successful at empowering a group of people in accomplishing a task. What did you do? Why did it work well?
- Describe a situation in which you had to arrive at a compromise or help others to compromise. What was your role? What steps did you take? What was the end result?
- Think of your best example of working co-operatively as a team member to accomplish an important goal. What was the goal or objective? To what extent did you interact with others on this project?
- Think about the most difficult challenge you have faced in trying to work co-operatively with someone who did not share the same ideas? What was your role in achieving the work objective? What was the long term impact on your ability to get things done while working with this person?
- Gaining the attention of others can be difficult. Think of a specific example when you had to do that in order to achieve a team goal. What did you do?
- Think about a work experience where you had to work closely with others. How did it go? How did you overcome any difficulties?
- Think about a team project. What did you do to contribute toward creating a teamwork environment?

TECHNICAL APPLICATION – *Has experience of using modern technology.*

- How do you identify your skills in using modern technology?
- What do you do to ensure you have access to the latest technologies in your field?
- How do you keep your information technology skills up to date?

TECHNICAL KNOWLEDGE - *Develops and maintains a knowledge of key trends in technology.*

- What do you do to ensure you understand how organisations work and how technology supports this?
- How do you ensure you are able to demonstrate a good knowledge of the industries relevant to the degree subject you are studying?
- How do you think technological knowledge can support the planning, designing, or implementation of solutions?

- How do you keep up to date with what is happening within your technological field over and above what is required for the degree programme?
- How do you demonstrate your knowledge of technological advances and the impact of these on working practices and organisational strategies?

TOLERANCE FOR STRESS - *Maintains performance under pressure and / or opposition.*

- Describe a time when you were able to effectively communicate a difficult or unpleasant idea to a superior. What did you do? What was the outcome?
- What do you do when priorities change quickly? Think of a situation when this happened. How did you react?
- Think about a time when you were particularly effective on prioritising tasks and completing a project under tight time constraints. What did you do?
- Thinking about a time when you achieved a great deal in a short amount of time, how did you feel? What was the outcome?

WRITTEN COMMUNICATION - *Expresses ideas effectively and conveys information appropriately and accurately.*

- We often need to document what work we have done in writing. Think of an example of how you have done that in the past. What was the outcome?
- Consider a time in which you had to use your written skills in order to get an important point across. How did you approach this? What was the result?
- Think about the most significant written document/report/presentation which you had to complete. What was difficult? What was easy? How did you feel about the result? What would you have done differently?

9. GLOSSARY OF COMPETENCY TERMS

Competencies and Criteria Definitions

For many years organisations have used competencies (often called criteria) as a means of describing the Knowledge, Skills and Attitudes required of job holders. This is a first endeavour at identifying similar criteria for employability skills within the different University subject areas participating in this project. The purpose of this approach is to enable some commonality of language between education and employers and to help students better articulate their transferable skills when applying for jobs outside their study discipline.

This is not an attempt to say that this set is 'right' and that all roles and jobs can be described using them but it is a start in making the whole area of competency based recruitment and assessment more transparent and accessible for academics, students and employers alike. Please try and work with them as far as possible, and update and develop them as new insights and learning occur.

Competency based assessments are used in a wide variety of ways in the world of work, some of these are:

- Recruitment
- Assessment
- Appraisals
- Career/personal development

Competencies like all tools, are intended to be used flexibly. The fixed element of the definitions are the titles and the short top level descriptions, the indicators serve to illustrate generic examples.

The indicators may be tailored to meet the specific needs of the university subject or employment role. For example Planning and Organising will be different in a Project Manager role and a Software Developer role, it would also be different for a full time student and a part time one. The **significance** of Planning and Organising is different between these roles and students, and the indicators need to reflect this difference when articulating examples of the skill of planning and organising.

Competencies can be grouped. This document has a standard set of groupings, but particular areas may be better served by combining the competencies into different groups.

Last Point

We will only improve this model by using it. Part of the measure of the success of this competency model will be based on the number of suggestions for improvements. We have already received a number of these and look forward to many more.

GLOSSARY OF TERMS**Descriptive Criteria and Indicators for Employability Competencies****i) COGNITIVE SKILLS**

The ability to identify, and solve problems, work with information and handle a mass of diverse data, assess risk and draw conclusions.

Analysis - *Relates and compares data from different sources, identifying issues, securing relevant information and identifying relationships.*

Indicators:

- Understands the meaning of written and verbal information.
- Sees several points of view and weighs up the alternatives accurately.
- Identifies potential problems, issues, and risks.
- Seeks out and uses facts where available.
- Identifies the root cause of a problem.
- Breaks down complex data and identifies the key information.
- Relates and compares data from several sources.
- Distinguishes between facts and assumptions.

Judgement - *Determines the most appropriate course of action and draws conclusions that are based on logical assumptions that reflect factual information.*

Indicators:

- Demonstrates an unbiased/rational approach.
- Uses logical arguments/reasoning.
- Reviews evidence before coming to a conclusion.
- Identifies alternative courses of action.
- Uses all relevant available information.
- Identifies strengths and weaknesses in arguments/situations.
- Draws clear conclusions from complex information.

Attention to Detail - *Accomplishes tasks through a concern for all areas involved, no matter how small.*

Indicators:

- Ensures that minor considerations are not overlooked.
- Checks written work for errors before submitting.
- Plans activities before undertaking them.
- Does not deter others from going into detail.
- Checks facts out (with others or source) where necessary.

ii) GENERIC COMPETENCIES

High-level and transferable skills such as the ability to work with others in a team, communicate, influence and have interpersonal sensitivity.

Planning and Organising - *Establishes a course of action for self and/or others to accomplish a specific goal. Plans proper assignments and appropriate allocation of resources.*

Indicators:

- Sets priorities to take account of short and long-term needs.
- Plans course of action before starting projects or activities.
- Sets targets and priorities.
- Adjusts work assignments or schedules for self and/or others to meet changing work priorities.
- Uses a system (e.g. calendar, time management methodology) to keep track of work schedules and deadlines.
- Has a clear agenda and set of objectives for meetings.
- Establishes sound procedures to manage and monitor assignments or project.
- Achieves tasks and assignments within the required timescale.

Influencing - *Influences others by expressing self effectively in a group and in one to one situations.*

Indicators:

- Gains commitment by putting forward arguments which are supported by logic and facts.
- Actively influences decisions.
- Presents arguments that can be supported by facts.
- Makes fluent and well organised contributions.
- Uses different approaches and influencing techniques that are appropriate to the people or situation.
- Speaks clearly and audibly.
- Contributes concisely.
- Speaks animatedly i.e. not too quickly.
- Summarises for the benefit of others/self.
- Retains the attention of his/her audience.
- Explains terminology in appropriate language.

Written Communication - *Expresses ideas effectively and conveys information appropriately and accurately.*

Indicators:

- Conveys complex concepts in words or diagrams.
- Structures information appropriately with clear introduction and conclusion.
- Documents are concise and easily understood.

- Spelling, punctuation and grammar are correct.
- Reports are well presented and conform to standards.
- The purpose of the communication is clear and actions are clearly stated.
- Varies vocabulary, style and tone according to the recipient.
- Uses appropriate and meaningful headings.
- Does not use unnecessary words/phrases.

Questioning - *Uses an appropriate approach to questioning in order to gain information from which to draw conclusions and/or assist in the making of decisions.*

Indicators:

- A set of questions is prepared in advance.
- Uses open questions to gain a breadth of information, (e.g. begin with how, what, when, where, why and who).
- Uses probing questions to pick up on relevant areas, (e.g. "You mentioned difficulties with.... What were they?").
- Uses closed questions to force a decision/commitment, (e.g. "Was that the right approach?").
- Uses leading questions appropriately to limit choice (e.g. "So should I do this or this?").
- Questions are clear and concise.

Listening - *Shows by a range of verbal and non-verbal signals that the information being received is understood.*

Indicators:

- Picks out key information in meetings.
- Actively shows interest.
- Summarises and tests understanding.
- Asks questions to clarify understanding and notes key facts.
- Demonstrates listening by taking notes, playing back what has been said etc.

Teamwork / Working with Others – *Builds and develops appropriate relationships with academic staff, peers, colleagues, customers and suppliers at all levels within an organisation.*

Indicators:

- Deals with difficult people effectively.
- Communicates at various levels within organisations.
- Deals effectively with customer issues.
- Is respected by academic staff and peers at all levels.

Interpersonal Sensitivity - *Recognises and respects different perspectives and appreciates the benefits of being open to the ideas and views of others.*

Indicators:

- Allows time for others to understand and contribute.
- Takes time to understand issues from other standpoints.
- Ensures that everyone is given the opportunity to contribute.
- Shares information with rest of the group.
- Encourages others to contribute.
- Involves others in the task.
- Builds on other people's ideas/actions.
- Acknowledges other people's contributions and perspectives.
- Avoids showing aggressive behaviour and making personal attacks on others.
- Questions others to establish their views and feelings.
- Has regard to the impact on people of his/her actions and decisions.

Organisational Sensitivity - *Is sensitive to the effect of his or her actions on other parts of the organisation and adopts a mature, direct and up front style in dealing with conflict.*

Indicators:

- Puts the good of the organisation before personal advantage.
- Discusses processes/practices in different parts of the organisation.
- Asks questions to determine the impact of decisions on others.
- Knows who needs to be influenced to achieve results.
- Demonstrates by words and actions that he/she recognises the impact of decisions of others.
- Actively seeks a win/win solution to professional/business issues.

Life Long Learning and Development - *Develops the skills and competencies of self, peers and colleagues through learning and development activities related to current and future roles.*

Indicators:

- Provides a good role model for others to follow.
- Regularly reviews objectives, improvement plans and career development plans.
- Gives regular feedback on performance, leading to a wide range of learning and development actions.
- Ensures that opportunities are found to reinforce new and developing skills.
- Identifies learning opportunities for self and others.
- Coaches others within own areas of expertise.
- Gives 'space' to others to develop skills.
- Encourages the use of mentors and role models.
- Seeks out opportunities to develop self and others.

iii) PERSONAL CAPABILITIES

The ability and desire to learn for oneself and improve one's self-awareness, emotional intelligence and performance. To be a self-starter (creativity, decisiveness, initiative) and to finish the job (flexibility, adaptability, tolerance to stress).

Personal Development Planning - *Maintains an up to date personal development plan and takes action to ensure personal development takes place.*

Indicators:

- Regularly reviews career and development plans.
- Maintains an up to date learning log.
- Maintains an up to date achievement portfolio.
- Puts time aside to further own skills and competencies.
- Initiates development reviews with appropriate others.
- Actively seeks feedback from colleagues and customers.
- Uses his/her network to gain feedback on performance.
- Develops the skills and competencies of peers/colleagues through learning and development activities related to achieving common goals.
- Provides a good role model for others to follow.
- Regularly reviews objectives, improvement plans and career development.
- Gives and requests regular feedback on performance, leading to a wide range of learning and development actions.
- Ensures that opportunities are found to reinforce new and developing skills.
- Learns and applies new information effectively.
- Keeps up to date in his/her area(s) of speciality.

Creativity – *Generates and/or recognises how best practice and imaginative ideas can be applied to different situations.*

Indicators:

- Tends to see the “whole” of situations.
- Breaks deadlocks with original thought.
- Looks for new or better ways of doing things.
- Produces unusual or lateral ideas.
- Recognises “innovative” solutions to work/study issues and develops them.
- Encourages others to think laterally and to generate ideas.
- Takes a broad and receptive view of situations and courses of action.
- Builds on other people's ideas.

Decisiveness - *Makes decisions and takes action.*

Indicators:

- Takes action without being prompted by others.
- Takes the first step to start a new idea.
- Makes decisions.

- Commits self and others.
- Assesses situations and alternatives quickly.
- Makes decisions that may result in criticism.
- Makes decisions based on incomplete information.

Initiative - *Identifies opportunities and is pro-active in putting forward ideas and potential solutions.*

Indicators:

- Tackles problems/issues without being asked.
- Often the first to speak/take action.
- Makes suggestions to solve problems and improve work processes/methods without being asked.
- Identifies a problem and recommends a solution.
- Does a job for which he/she is not responsible because it will help colleagues/the department/the company.
- Takes on tasks outside his/her normal role.
- Seeks new opportunities.
- Gets involved.
- Offers support to others.
- Sets challenging goals and standards of performance for self and others.
- Does more than the minimum.
- Expresses dissatisfaction with the average.
- Doesn't like "making do".
- Does a good job for the sake of it.
- Assigns tasks, actions and dates.
- Uses control systems, statistics, regular reports, bring ups etc. as appropriate.
- Monitors and checks plans and follow-up actions to ensure completion of tasks.
- Assigns tasks, actions and dates.

Adaptability / Flexibility - *Maintains effectiveness in a changing environment.*

Indicators:

- Changes or modifies approach/style in order to reach the desired goals.
- Responds positively to external changes: e.g. changes in industry / profession, environment/political changes.
- Responds quickly to new information.
- Responds quickly to changes in objectives/direction.
- Recognises when current approaches will not work.
- Modifies behaviour to obtain results.
- Changes direction/tackles new tasks and returns to original task with no loss of effect.
- Handles several activities simultaneously with no loss of control.
- Adjusts schedules and activities to take account of changing requirements and priorities.

- Handles a variety of inputs and acts on the priorities.
- Quickly focuses on new topics.

Achievement Orientation - *Maintains and inspires a results-driven approach, focuses on results and critical performance indicators.*

Indicators:

- Translates ideas into objectives/goals and actions.
- Seeks responsibility and challenge.
- Takes prompt action to get things done.
- Accepts tight deadlines.
- Acts to minimise risks.
- Pursues issues until results are achieved.
- Identifies business opportunities.
- Keeps trying to achieve goals despite obstacles or failure.
- Overcomes setbacks in order to drive forward a plan of action.
- Effectively attempts to seek answers to questions/information.

Tolerance for stress - *Maintains performance under pressure and / or opposition.*

Indicators:

- Works well under time pressure.
- Relaxes before and/or during key events.
- Maintains calm appearance under pressure/when busy or opposed.
- Responds positively when conflict arises.

Leadership - *Takes responsibility for the directions and actions of a team.*

Indicators:

- Gains the confidence and respect of both academic staff and peers.
- Motivates others to achieve objectives even when these seem difficult to achieve.
- Provides a positive work environment (resources, attitude etc).
- Delegates tasks and responsibility without losing control.
- Allocates work and responsibilities.
- Clarifies what needs to be done and sets team objectives.
- Displays flexibility of style according to group and/or tasks.
- Addresses issues of weakness and conflict and take appropriate decisions.
- Develops/encourages a sense of purpose and unity in the team.
- Sets up processes/plans to make the team more effective.
- Keeps the objectives of the task in the mind of self and others.
- Makes unpopular decisions to get the task done.
- Looked to by others for advice and guidance.
- Reviews progress against plans.
- Recognises potential conflict and acts to defuse it.

iv) TECHNICAL ABILITY

For example, having the knowledge and experience of working with relevant modern technology.

Technical Knowledge - *develops and maintains a knowledge of key trends in technology.*

Indicators:

- Understands how organisations work and how technology supports this.
- Demonstrates a good knowledge of the industries relevant to the degree subject being studied.
- Uses technological knowledge when planning, designing, or implementing solutions.
- Keeps up to date with what is happening within the technological field over and above what is required for the degree programme.
- Demonstrates a good knowledge of technological advances and the impact of these on working practices and organisational strategies.

Technical Application – *has experience of using modern technology.*

Indicators:

- Demonstrates a good knowledge of equipment used in own field of study.
- Knows where to go to find suitable resources both inside and outside their academic institution in order to get relevant technical experience.

v) BUSINESS AND / OR ORGANISATION AWARENESS

An appreciation of how businesses operate through having had (preferably relevant) work experience. Appreciation of organisational culture, policies and processes.

Organisational Understanding - *Understands the organisation's work environment, internal politics, business objectives and strategy.*

Indicators:

- Ensures contacts are appropriate for the work being undertaken.
- Knows the relevant internal processes.
- Demonstrates knowledge of the company's business outside of that specifically required in his/her role.
- Makes realistic commitments.
- Delivers outcomes to the agreed level.
- Seeks to understand changing requirements.
- Demonstrates a determination to ensure satisfaction.

Commercial Awareness - *Understands the economics of the business. Understands the business benefits and commercial realities from both the organisation's and the customer's perspectives.*

Indicators:

- Demonstrates breadth of awareness of business knowledge (e.g. recognises issues in finance, sales, marketing).
- Shows consideration of such business implications as increased revenue/profit, decreased expenditure, increased productivity, improved company image and market share.
- Identifies new business opportunities.
- Takes commercial constraints into account.
- Ability to analyse financial trends (e.g. revenue, profit, productivity) and forecast accordingly.

Financial Awareness – *Understands basic financial terms used in organisations and is able to construct and maintain simple financial records.*

Indicators:

- Produces and maintains a Profit and Loss account for a project, programme or practice.
- Produces a budget.
- Maintains financial records.
- Produces forecasts.
- Sets and meets financial targets.
- Analyses financial trends (e.g. revenue, profit, cash flow) and forecasts.

vi) PRACTICAL AND PROFESSIONAL ELEMENTS

Critical evaluation of the outcomes of professional practice, reflect and review own practice, participate in and review quality control processes and risk management.

Professional Expertise - *Keeps up to date with developments in own areas of professional specialisation. Applies a breadth and/or depth of professional knowledge.*

Indicators:

- Learns and applies new information effectively.
- Keeps up to date in their area(s) of speciality.
- Effectively presents professional information to others.
- Makes best use of their professional knowledge when planning, designing and implementing solutions.
- Shares their professional expertise with others.
- Demonstrates a knowledge of the latest methodologies and processes in own specialist area.
- Is part of a professional network.
- Actively seeks new people to become part of his/her network.

- Is contacted by others as part of their network.
- Attends conferences/seminars in his/her area of expertise.

Process Operation - *Begins, controls and concludes a complete process or procedure.*

Indicators:

- Is familiar with, and can describe the steps involved in, relevant processes or procedures.
- Operates processes and procedures effectively.
- Recognises that the department's output is another department's input.

Image - *Presents a strong, professional, positive image to others at all times, consistent with all people (colleagues, management and peers, customers etc.).*

Indicators:

- Appears smart and tidy.
- Is relaxed and confident in the company of others.
- Is enthusiastic/positive.
- Gives others the impression of professionalism, subject knowledge and assertiveness.
- Gains attention and respect from others e.g. from initial impact.

10. FURTHER CONSIDERATIONS AND LINKS

The Bologna Declaration: Tuning Project.

In the summer of 2000, a group of universities has taken up the Bologna challenge collectively and designed a pilot project called "Tuning educational structures in Europe". The Tuning project addresses several of the Bologna action lines and notably the adoption of a system of easily readable and comparable degrees, the adoption of a system based on two cycles and the establishment of a system of credits. More specifically, the project aims at identifying points of reference for generic and subject-specific competences of first and second cycle graduates in a series of subject areas: Business Administration, Education Sciences, Geology, History, Mathematics, Physics and Chemistry. Competences describe learning outcomes: what a learner knows or is able to demonstrate after the completion of a learning process. This concerns both subject specific competences and generic competences like communication skills and leadership.

- **National Occupational Standards**
- **The work of Professor Stephen McNair**
- **The work of Professor Mantz Yorke**

Higher Education Academy
The Council for Industry and Higher Education
Skills for Business
ESECT

<http://www.heacademy.ac.uk/>

<http://www.cihe-uk.com>

<http://www.ssda.org.uk>

<http://www.ltsn.ac.uk/ESECT>

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STUDENT EMPLOYABILITY PROFILES

PHYSICS

For Employers (Recruiters and Human Resource Developers)

What are the implications for employers of the changes taking place in UK higher education, changes which are enabling more and more students to develop and apply practical, work-related skills during their study so that they are ready on graduation to take their place in the world of work? What does this mean for people's life long learning capability? What sort of investment am I as an employer making in graduate recruitment and staff development? Is student work placement more valuable than before? Can I recruit graduates from a wider selection of subjects? How do I manage risk in recruiting people with backgrounds different to current staff?

Just as competency-based recruitment and human resource development has become embedded in recent years as good practice amongst employers in the public and private sectors, so there are parallel initiatives within higher education to help students develop employability skills, to raise their awareness of these skills in themselves, and to articulate and apply them to their benefit and to the benefit of employers. Increasingly, students are learning and applying work-related skills during higher education, through study, work experience and extra curricular activities.

A high percentage of UK graduates choose professional roles that bear no direct relation to the subject studied at university. For them, it is a high priority to be able to demonstrate they have sound personal transferable skills of value to employers. Even for those that embark on subject related careers, there are likely to be radical job changes from time to time in the future. So for all students, employability matters.

Student employability profiles have now been developed which offer insights into the skills students are likely to have developed with degrees in particular subjects. This can help employers improve the return on their investment in graduate recruitment, work placement and staff training and development.

Employers have identified the attributes they seek in the graduates they recruit. The qualities or attributes used here have been identified and categorised by employer members of the Policy Forum of the Council for Industry and Higher Education. They are the key components they have observed in those individuals who can transform organisations and add value early in their careers (see the report *Graduates Work* by Professor Lee Harvey, CIHE 2001) and comprise:

- **Cognitive Skills/Brainpower:** The ability to identify and solve problems; work with information and handle a mass of diverse data, assess risk and draw conclusions.
- **Generic Competencies:** High-level and transferable key skills such as the ability to work with others in a team, communicate, persuade and have interpersonal sensitivity.

- **Personal Capabilities:** The ability and desire to learn for oneself and improve one's self awareness and performance. To be a self starter (creativity, decisiveness, initiative) and to finish the job (flexibility, adaptability, tolerance to stress).
- **Technical Ability:** For example, having the knowledge and experience of working with relevant modern laboratory equipment.
- **Business and / or Organisation Awareness:** An appreciation of how businesses operate through having had (preferably relevant) work experience.
- **Practical Elements - Vocational Courses:** Critical evaluation of the outcomes of professional practice; reflect and review own practice; participate in and review quality control processes and risk management.

An individual student may identify examples of their own skills development during the course of study and may map these against the list of attributes and qualities typically desired by employers, so enabling the student to translate their learning experiences into language helpful to employers

1. PHYSICS - EMPLOYABILITY SKILLS

The **specific** employability skills that can be gained by studying Physics, as identified by the Quality Assurance Agency (QAA) Subject Benchmark Statements, are:

- Knowledge and understanding of most fundamental physical laws and principles, and develop competence in the application of these principles to diverse areas of physics;
- Formulate and tackle problems in physics by identifying the appropriate physical principles, using science techniques such as special and limiting cases and order-of-magnitude estimates to guide thinking about a problem;
- Present problem solutions by making assumptions and approximations explicit. Develop the ability to identify relevant principles and laws of physics when dealing with problems;
- Plan, carry out, analyse and report the results of an experiment or investigation;
- Use appropriate methods to analyse the data produced and evaluate the level of uncertainty in the results, compare these results with expected outcomes, relate any conclusions to current theories of the physics involved and theoretical predictions or published data, and assess their significance;
- Use mathematics to describe the physical world;
- Develop an understanding of mathematical modeling and of the role of approximation in order to compare critically the results of model calculations with

those from experiment and observation;

- Physics degree programmes involve the solving of problems with well-defined solutions as well as tackling open-ended problems. This develops the ability to formulate problems in precise terms and to identify key issues. Students will develop the confidence to try different approaches in order to make progress on challenging problems.
- Develop skills of independent investigation through using textbooks, and other available literature, searching databases and interacting with colleagues/peers to extract important information.
- Physics and the mathematics used in physics deal with surprising ideas and difficult concepts therefore good communication is essential, the ability to listen carefully, to read demanding texts, and to present complex information in a clear and concise manner is essential.
- Paying attention to detail and to developing the ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly are skills developed through the study of physics.
- Develop computing and IT skills in a variety of ways, including the ability to use appropriate software such as programming languages and packages. Display competent use of appropriate IT packages/systems for the analysis of data and the retrieval of appropriate information;
- Develop the ability to work independently, to use initiative, plan and organise to meet deadlines, and interact constructively with other people.
- Develop an ability in numerical manipulation and the ability to present and interpret information graphically;
- Communicate scientific information, in particular through scientific reports. Solve problems in physics using appropriate mathematical tools. Identify the relevant physical principles and make approximations necessary to obtain solutions. In particular, produce clear and accurate scientific reports.
- Manage own learning and make use of appropriate texts and learning materials, research-based materials or other learning resources;
- Display sound familiarity with laboratory apparatus and techniques if on experimental programmes.
- Execute and analyse critically the results of an experiment or investigation and draw valid conclusions;
- Evaluate the level of uncertainty in experiment results and compare these results with expected outcomes, theoretical predictions or with published data. Evaluate the significance of the results in this context.

An individual student may identify examples of their own skills development from this list of possible skills. These examples may then be mapped against the employers' list of qualities and attributes above, providing evidence of value to employers. Students who do this will be better prepared to make a good account of themselves in CVs and at interview for graduate jobs and work placements.

GLOSSARY OF COMPETENCIES in alphabetical order**(Abbreviated)**

ACHIEVEMENT ORIENTATION	Maintains and inspires a results-driven approach, focuses on results and critical performance indicators.
ADAPTABILITY / FLEXIBILITY	Maintains effectiveness in a changing environment.
ANALYSIS	Relates and compares data from different sources, identifying issues, securing relevant information and identifying relationships
ATTENTION TO DETAIL	Accomplishes tasks through a concern for all areas involved, no matter how small.
COMMERCIAL AWARENESS	Understands the economics of the business. Understands the business benefits and commercial realities from both the organisation's and the customer's perspectives.
CREATIVITY	Generates and/or recognises how best practice and imaginative ideas can be applied to different situations
DECISIVENESS	Makes decisions and takes action
FINANCIAL AWARENESS	Understands basic financial terminology used in organisations and is able to construct and maintain simple financial records.
IMAGE	Presents a strong, professional, positive image to others at all times. This image is consistent with all people (colleagues, management and peers, customers etc.).
INFLUENCING	Influences others by expressing self effectively in a group and in one to one situations
INITIATIVE	Identifies opportunities and is pro-activity in putting forward ideas and potential solutions
INTERPERSONAL SENSITIVITY	Recognises and respects different perspectives and appreciates the benefits of being open to the ideas and views of others.
JUDGEMENT	Determines the most appropriate course of action and draws conclusions that are based on logical assumptions that reflect factual information.

LEADERSHIP	Takes responsibility for the directions and actions of a team
LIFE LONG LEARNING AND DEVELOPMENT	Develops the skills and competencies of self, peers and colleagues through learning and development activities related to current and future roles.
LISTENING	Shows by a range of verbal and non-verbal signals that the information being received is understood.
ORGANISATION UNDERSTANDING	Understands the organisation's work environment, internal politics, business objectives and strategy
ORGANISATIONAL SENSITIVITY	Is sensitive to the effect of his or her actions on other parts of the organisation and adopts a mature, direct and up front style in dealing with conflict
PERSONAL DEVELOPMENT	Maintains an up to date personal development plan and takes action to ensure personal development takes place.
PLANNING AND ORGANISING	Establishes a course of action for self and/or others to accomplish a specific goal. Plans proper assignments of personnel and appropriate allocation of resources.
PROCESS OPERATION	Begins, controls and concludes a complete process or procedure.
PROFESSIONAL EXPERTISE	Keeps up to date with developments in own areas of professional specialisation. Applies a breadth and/or depth of professional knowledge.
QUESTIONING	Uses an appropriate approach to questioning in order to gain information from which to draw conclusions and/or assist in the making of decisions.
TEAMWORK / WORKING WITH OTHERS	Builds and develops appropriate relationships with academic staff, peers, colleagues, customers and suppliers at all levels within an organisation
TECHNICAL APPLICATION	Has experience of using modern technology
TECHNICAL KNOWLEDGE	Develops and maintains a knowledge of key trends in technology
TOLERANCE FOR STRESS	Maintains performance under pressure and / or opposition.
WRITTEN COMMUNICATION	Expresses ideas effectively and conveys information appropriately and accurately