

STEM SUBJECT CHOICE AND CAREERS PROJECT

Careers IAG Resources Mapping

Introduction

This short report provides an overview of the mapping exercise being undertaken to collect and review STEM careers information resources currently available. To date, over 500 resources have been catalogued.

This report is in two parts:

- A. The context and an overview of the findings of a mapping exercise of STEM careers resources set against evaluation criteria linked to the IAG National Standards.
- B. A set of general guidelines for STEM stakeholders linked to the IAG National Standards (adapted from a report to the STEM Careers Stakeholder Advisory Group).

Part A

1. National Standards for Information, Advice and Guidance

From April 2008, new Quality Standards have applied to the provision of information, advice and guidance (IAG) for young people in England. IAG covers a range of activities and interventions that help young people to become more self-reliant and better able to manage their personal and career development, including learning. The standards are intended to help raise the overall quality of provision.

High quality provision that helps young people make good decisions about courses and careers relies on a co-ordinated effort between a range of key players including:

- Teachers and tutors
- Parents and carers
- Employers
- Connexions advisers
- Other agencies

The aim of the STEM Subject Choice and Careers Project, working with others, is to help the STEM community have a more co-ordinated and consistent impact on young people's choices.

2. Information in Schools

Most schools and colleges still have a Connexions Resources Centre, or a Careers library within their Learning Resource Centre, where careers information is housed and interviews may take place. Increasingly, schools and colleges are providing additional careers information online through their intranets and VLEs. Online area-wide prospectuses have

been introduced to provide young people with access to the full range of information on courses in their local area.

3. An overview of the preliminary findings of a mapping exercise of STEM careers resources set against evaluation criteria linked to the IAG National Standards.

There are many careers resources and intervention schemes to promote careers within STEM. Careers information resources can take many forms from the traditional leaflet with information about the role, provision of lists of subject choices and courses available right through to individual 'stories' from people working within the sector. Part of the aims of the Subject Choice and Careers Project has been to harness and promote the best of what has already been developed, but also to identify the types of resource that exist so that a more coordinated approach may be adopted for the future.

Rather than just mapping what exists we decided to take the opportunity of the new IAG Standards framework to evaluate¹ existing resources against the extracted and cross-referenced standards. The original plan was to carry out a one off exercise to map resources and inform the work under AP8. Indeed it would have been easier to just identify as many materials that we could find as a simple mapping exercise. However this approach would have missed a great deal of useful data that we have captured. We have identified a clear need for the mapping to continue throughout the project as new resources become available and as existing resources are updated.

We have designed a database (Access) to catalogue the evaluations to capture a section of the huge amount of careers resources available, and details of formats of resources. We have over 548 resources collected, registered and evaluated between May 2008 and October 2010 (some original resources from 2008 have been revisited and updated). The National STEM Centre library is to host a selection of useful careers resources in a wide range of formats for use by teachers along with a copy of the database.

The main sections of the database are:

- **Target Audience**

Resources can be designed to meet the needs of a single target audience, multiple audiences or the audience may not be specified. The National Standards call for resources to be accessible and designing resources to reach different age groups supports accessibility. We found a number of resources with good quality information on STEM careers, presented in ways that make it inaccessible to young people e.g. full pages of solid textual information on websites with no images. Target audiences identified are ks3, ks4, post 16, parent / carer, teachers and careers practitioners. We have no resources as yet targeted at primary school age.

- **Resources Overview.**

¹ This is an evaluation of content in its broadest sense, i.e. a measure of *content validity*

Careers resources serve a wide range of purposes depending on the role of the organisation producing them. Organisations within the career sector follow an impartial and standard pattern of resource type and structure for careers in or out of STEM. However there has been some concern for some time (CASE, 2007¹) from STEM community that the careers professionals' knowledge of STEM is less than their knowledge in some other sectors. A need to expand the information on STEM careers resources has been partly addressed by means of STEM Choices, part of STEM Careers Project. In addition Future Morph (Science Council), Maths Careers (IMA and maths and stats community) and, more recently Tomorrow's Engineers (Engineering UK) have contributed a comprehensive and coordinated approach to the provision of STEM careers resources. Resources produced by professional institutes, sector skills councils continue to promote STEM careers within their remit. Professional institutions often also provide educational resources and activities which provide added value in careers information. Some of the smaller institutions have limited resources and provide only basic information. The type of resource offered by employers varies considerably

- **Resource Type.**

Resource types identified include the traditional hard copies of leaflets/ brochures / catalogues that can be downloaded. Magazines and newspapers focusing on careers have increased. Posters can provide useful promotional material particularly for teachers in classroom displays. Websites that provide core information coupled with podcasts, video clips and interactive opportunities are the main resource type. Courses and TV or radio based resources are also identified.

Individual case studies and stories have recently become very popular:

<http://www.careersbox.co.uk/>

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

http://www.stemnet.org.uk/ambassadors/leading_lights.cfm

http://www.scenta.co.uk/careers/role_models.cfm

- **Subject areas.**

We have taken the job families according to the Careers Information Library (CLCI) and expanded appropriately to include additional specific STEM careers. We have drawn on Jobs4u which has been recently expanded to include more STEM related careers.

- **Organisations.** The organisation hosting the resource is listed within the database.

- **Evaluation Criteria.**

The evaluation criteria are drawn from the National Standards and are applied to the resource where appropriate. Exemplar resources have been identified. These resources are those that comply with all relevant criteria...including 'being inspiring and interesting to young people.'

4. Identification of areas for development.

The weakest resources found so far come from small organisations with specific interest areas - that clearly do not have the resources to offer a full career information section. The potential for small organisations to provide good quality careers information may well be limited by the human resources available to them to provide content and update it. There may be potential in advising such STEM organisations to focus on illustrative case studies using real role models and offer signposts to mainstream general website (Future Morph, Tomorrow's Engineers or MathsCareers) for all other information.

General areas for improvement identified to date include:

- Large areas of texts with no or few images - may include some examples of what the work involves and refers to qualifications to enter the field, but is too technical for use with young people or documents for download include pages of text only.
- Descriptions of what the subject area covers without mentioning the careers and jobs involved.
- Information over 5 years old and obviously out of date.
- Lack of young role models...to engage young people
- Lack of diversity in role models...but a need to ensure balance is realistic and doesn't give a false impression.
- Evidence of subjectivity that is misleading e.g. promoting pathology as degree option without information on employment prospects.

5. Any other issues and gaps that have been identified.

- The provision of engaging and colourful posters for schools is always popular with teachers. We have noted that displays in schools can really promote STEM. We would like to explore the impact of such displays. At CSE we have also developed activities to go with posters and these have been found to be popular. We have evidence from our STEM Careers Lead Practitioners of referring to posters within their teaching - so that pupils can make the link right there in the classroom.
- What are future careers areas that will develop? We need to do more research in this area to ensure new careers are addressed - e.g. drawing on Science So What Campaign or Future Morph?
- We need to ensure that stepping stones and pathways from 16 include a range of routes. There are a number of personal stories within resources that show that people can progress via a range of routes e.g. apprenticeships.
- Much of the information is hard to find. Signposting is key...and the role of Futuremorph (and MathsCareers) will be valuable here.

6. Future points to address:

- Is there scope to develop and draw on additional careers resources within the STEM Directories?
- Can we consider the evaluation of careers information in terms of three key aspects?
 - Continued evaluation to determine the *content validity* of resources, based on the framework captured in this paper
 - Uptake evaluation, based on measuring teacher and pupil awareness and use of available resources
 - Impact evaluation i.e. how effective are specific resources, based on encouraging stakeholders to adopt appropriate evaluation approaches based on the emerging national evaluation framework.
- While there is a clear move towards online information and resources, schools often prefer hard copies of literature. We have found that there are often delays in sending out individual items. Is it feasible to organise a future STEM resource annual mail out?
- We hope that STEM organisations can make better informed decisions about the type, scope and content of information resources required to support effective STEM subject choice and career decision making in school.
- With the support of the Careers Advisory Panel, active stakeholders and the National STEM Careers Co-ordinator we hope that some orchestration of the production of new resources can be implemented, creating better coverage of the 'gaps' identified and in support of small organisations to provide the most effective and useful careers information that meets the needs of the target group.

Part B

Guidelines for STEM Organisations on Producing Information

Careers information includes factual information (e.g. course directories), promotional literature (e.g. employers' recruitment information) and careers education materials (e.g. case studies used in a lesson on career planning). It also includes the careers information that is delivered through enhancement activities such as after-school clubs, taster days, courses and visits.

It can be presented in a wide variety of media, e.g. print-based (books, leaflets, posters, etc.) and audio-visual/interactive (TV, radio, video, podcast, etc.).

The following guidelines are for STEM organisations involved in the production of careers information. They are cross-referenced to the IAG Standards (in brackets).

1. Information should be accurate and up-to-date (3.1)

Organisations producing careers information need to have a checking process for verifying the accuracy and up-to-datedness of the information before it is disseminated.

Schools and colleges have a statutory duty to provide young people with access to a wide range of up-to-date reference materials relating to careers education and career opportunities (Education Act 1997). They will normally replace 'hard' careers information (e.g. employment facts and figures) annually and 'soft' careers information (e.g. occupational descriptions) after two to three years. Organisations producing new careers information need to consider maintenance and sustainability issues.

2. Information should be impartial (3.1, 3.4)

A clause in the Education and Skills Act 2008 requires schools to provide careers information and advice that is impartial. They will normally refuse to include information created for promotional and marketing purposes in their libraries that is disguised or semi-disguised as 'factual' careers information. Young people attribute different types of authority to careers information. The test here, therefore, is: 'has it been made explicit to the young person in the information itself that it has been created for campaigning or advertising purposes?'

3. Information should not misrepresent or mislead (3.4, 5.5)

It would be quite difficult to produce totally 'objective' careers information and the results could be quite boring, but every effort should be made to represent the course, job or career as accurately as possible. Young people have a need for 'subjective' information such as other people's stories that they can weigh up or evaluate. In the case of subjective

information, the same standards are relevant that would be applied to the production of a CV. It is not acceptable to mislead or tell deliberate untruths.

4. Information should be accessible (2.1, 5.2, 5.6, 6.1)

Young people can feel that careers information is inaccessible to them for a wide range of reasons, e.g.:

- It is 'unreadable' - densely written and the assumed reading age is inappropriate
- The presentation is unattractive, unappealing and passive. Active and interactive materials are more likely to engage young people
- It is not perceived as relevant to them (no images of people from the same ethnic background as themselves)
- They do not have ready access to the media or software that the information has been produced in
- They have limited literacy skills, e.g. young people with specific learning difficulties

It is good practice to:

- Involve young people and teachers in the development of information – they have a better feel for what other young people want to know and how they want to receive it!
- Personalise careers information wherever possible. 'One-size fits all' careers information has limitations.
- Pilot information so that it can be evaluated.

5. Information should strengthen equality of opportunity and respect for diversity (5.1-5.6)

Information that presents STEM courses, jobs or careers in a stereotypical way is likely to limit young people's access to opportunities. Careers information should challenge restrictions on young people's options and choices by:

- avoiding implicit as well as explicit stereotypes
- guarding against errors of omission, e.g. by not including case studies of disabled people
- showing people who have followed a non traditional entry route or who work in a non traditional area, e.g. men in caring situations and women in hard technical situations
- using images as well as text to promote diversity and challenge stereotyping
- avoiding 'cosmetic' gestures e.g. the token female or person from a BME background or conversely all female or BME images
- preventing the exclusion of specific groups, e.g. by arranging an industry visit to a brewery for Muslim young people
- 'mainstreaming' issues such as gender, faith and disability to ensure that information appeals equally to the needs and interests of all groups and does not demean any particular group, e.g. in relation to gender, by using images of women in 'sexy underwear'
- using gender free words and phrases in describing the jobs people do, e.g. 'supervisor' instead of 'foreman'
- Designing information that raises the aspirations of all groups.

The STEM Subject Choice and Careers E&D online toolkit provides information and tools for those creating resources for schools and colleges www.stem-e-and-d-toolkit.co.uk .

6. Information should be designed for use in a clear context (7.11)

Producers of STEM subject choice and careers information should have a clear idea of the way in which the information will be used, e.g.:

- if it is to be used in a careers education context, have a model in mind of where and how the information fits into the career planning and decision-making process; and how the information can contribute to young people's career learning
- Consider providing information and/or guidance notes for those who support young people in using careers information, e.g. parents and carers, teachers, personal advisers.

A Ten-Point Checklist

1. Are the resources clearly targeted and appropriate for the different age groups (primary (5-11), KS3 (12-14) KS4 (14-16) and post 16?)
2. Is the information up-to-date and accurate?
3. Do the resources signpost young people to further information and help? (e.g. the local area prospectus)
4. Is the choice of format (paper-based, web-based, etc.) fit for purpose?
5. Do the resources challenge stereotyping and encourage inclusion and diversity?
6. Do the resources communicate information about trends in employment in terms of available occupations and growth and decline in specific sectors?
7. Do the resources directly support delivery of the STEM curriculum and broader personal, social and enterprise education?
8. Does the information include guidance about the full range of acceptable routes to qualifications?
9. Are materials inspiring and interesting for young people? Do they encourage them to aspire as well as presenting opportunities in a range of levels and roles?
10. Have young people been involved in the development of the resource?

STEM CAREERS - CAREER FAMILIES USED IN MAPPING

Note: Career family groups were taken from the 'jobs4u' website

SCIENCE

- BIOLOGY
- CHEMISTRY
- ENVIRONMENTAL
- FOOD, FORENSIC & MATERIAL
- PHYSICS
- HEALTH CARE
- OTHER

ENGINEERING

- BUILT ENVIROMNENT
- CIVIL ENGINEERING
- ELECTRICAL & ELECTRONIC
- ENERGY & POWER INDUSTRIES
- AERONAUTICAL & AEROSPACE
- MECHANICAL & MARINE
- CHEMICAL ENGINEERING
- GENERAL ENGINEERING

TECHNOLOGY

- COMPUTING & IT
- SOFTWARE

MATHS

- STATISTICS & ECONOMICS
- PURE
- APPLIED

TEACHING

- Biology
 - Chemistry
 - IT
 - Maths
 - Physics
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