Organising effective career events/activities

Institute of Physics
SOS Network meeting
8 September 2011
Organising effective career events/activities

- Image of physics
- Delivering the message
- Gender awareness
1. Image of physics

Charles Tracy
Head of Education, pre-19.
Semiotics research

- What are people’s perceptions of physics?
- What deeper symbolism underpins these images?
- How is the image of the physicist/scientist constructed in popular culture?
- What can we take from the image of physics to make it intriguing and attractive to students?
- How can we build on existing associations?
The symbolism of physics

- A triumph of enlightenment
- Reverence
- Physics makes us see the world anew
- Order
- “Theory of everything”
- Pure Intelligence
- Mystery and Mastery
- Infinite Progress
Physics in popular culture

- Mad scientist
- Cold, calculating
- Not athletic

But also

- Rogue hero
  - Geek chic
  - Outsider/underdog
  - Mythbuster
- Power and responsibility – The doctor in Dr Who
- Entrepreneurial/free
Branding physics

- Don’t pretend it’s easy – intellectual rigour
- Differentiate the world of physics from other study
- Use it to intrigue
- Creative energy
  - Imagination
  - Radical, courageous
  - About the future
- The everyday and the infinite; big and small
- It’s a strange place, the Universe
- Mind expansion
- Poetry and cultural entitlement
- See the world differently . . .
Physics

See the world differently.

IOP Institute of Physics

See more at physics.org/world
PHYSICS

See the world differently.

See more at physics.org/world
Discussion

What are messages about subject-choice for different audiences?

Are there any ways you could implement these ideas?

What are the messages for subject choice?

What does it tell us about the role of careers?
Delivering the message

Taj Bhutta,
Careers and Student officer, pre-19
Many school events can have a careers element

- Careers-fair
- Lecture
- Sixth form open day
- Simulation/enterprise activity
- STEM club activities, competitions and projects
Example:

Interactive lecture on medical physics for year 10 students

<table>
<thead>
<tr>
<th>Career message</th>
<th>Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studying physics can lead to a job in which you develop new ways of diagnosing and treating illness</td>
<td>Prior to event provide students with career-profile of presenter</td>
</tr>
</tbody>
</table>
Example:

Open evening for year 11 Parents at a sixth form college

<table>
<thead>
<tr>
<th>Career message</th>
<th>Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-level physics keeps your son/daughters options open and enhances their earning potential.</td>
<td>Provide parents with Russell group (Post-16 choices) and PWC (economic benefits of a degree) report data.</td>
</tr>
</tbody>
</table>
Russell-Group report

A-levels considered “essential” for studying different degrees

Number of degrees

Mathematics
Physics
Biology
Chemistry
French
German
Geography
Spanish
English
English Literature
Italian
History
Design Technology
Ancient Greek
Art
Latin
Music

(Informed Choices: a Russell group guide to making decisions about Post-16 education)
(21-60 year olds, compared to those holding 2 or more A-levels: Labour Force Surveys 2000-2004 pooled)
Example:

Speed-dating careers event for sixth-form students

<table>
<thead>
<tr>
<th>Career message</th>
<th>Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>A degree in physics is valued by employers in a wide range of sectors</td>
<td>Invite patent lawyer; financial strategist, and computer games designer as well as working physicists.</td>
</tr>
</tbody>
</table>
IOP resources to help
Discussion

Outreach versus In-reach?

Issues for university departments in organising events?
3. Gender awareness - managing groups and role models

Clare Thomson,
Curriculum and Diversity Manager, pre-19
Be Gender Aware

- Post-16: the proportion of girls choosing physics remains around 22%
- Physics has a highly gendered image
- Make sure any activity is planned with ‘gender-aware spectacles’ on!
- Messages may need to be more nuanced for girls
AS Physics entries 2002-11

Number of entries

Year


GIRLS - physics
BOYS - physics
All-physics

IOP Institute of Physics
A level entries for Girls in Science and Maths (JCQ)

- maths and further maths
- biology
- maths
- chemistry
- physics
- further maths

Year

- 1980
- 1985
- 1990
- 1995
- 2000
- 2005
- 2010
- 2015

Number of entries

- 0
- 5000
- 10000
- 15000
- 20000
- 25000
- 30000
- 35000
- 40000
The top five items boys would like to learn about in science and the top five for girls (English ROSE data)

<table>
<thead>
<tr>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Explosive chemicals</td>
<td>• Why we dream when we are sleeping and what the dreams</td>
</tr>
<tr>
<td>• How it feels to be weightless in space</td>
<td>might mean</td>
</tr>
<tr>
<td>• How the atom bomb functions</td>
<td>• Cancer – what we know and how we can treat it</td>
</tr>
<tr>
<td>• Biological and chemical weapons and what they do to</td>
<td>• How to perform first aid and use basic medical equipment</td>
</tr>
<tr>
<td>the human body</td>
<td>• How to exercise the body to keep it fit and strong</td>
</tr>
<tr>
<td>• Black holes, supernovae and other spectacular objects</td>
<td>• Sexually transmitted diseases and how to be protected</td>
</tr>
<tr>
<td>in outer space</td>
<td>against them</td>
</tr>
</tbody>
</table>
Managing groups

- Think about whether single sex or mixed groups are most appropriate for the activity.

- Assign roles to people in the group and change these during the activity if possible.

- Think about whether your groups take account of ability or are they deliberately mixed ability.

- Does the size of the group allow for all to actively engage?
Gender aware role selection: An example

Role selection by skills

<table>
<thead>
<tr>
<th></th>
<th>Organisation Leadership Planning</th>
<th>Analytical Using diagrams Numerical</th>
<th>Spatially aware Analytical Numerical</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Creative Analytical Visual</th>
<th>Creative Spatially aware Using diagrams</th>
<th>Attention to detail Advising others Assessing risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 minute
Gender aware role selection: An example

Role selection by skills

<table>
<thead>
<tr>
<th></th>
<th>Project manager</th>
<th>Electrical engineer</th>
<th>Sound engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Lighting engineer</th>
<th>Construction manager</th>
<th>Health and safety advisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IOP Institute of Physics
Role model guidelines

- Ensure role models have adequate prior information.
- Allow pupils to interview the role models.
- Role models should personalise their experience and allow questions related to having a family, etc.
- The nature and purpose of scientific research is as important to discuss as the details.
- Bring in resources from the working environment.
- Don’t over-simplify complex issues.
- Use accessible language, images examples and analogies.
Girls are more likely to continue with physics after the age of 16 if:

- physics is taught in a way that engages with the interests of young people
- there is an expectation that anyone can do physics
- activities are managed to ensure active participation by all students
- the focus of learning is ideas rather than unconnected facts
- young people understand the contribution that physics makes to society and can make to their lives.
Engaging with Girls –
Increasing the participation of girls in physics -
an action pack for teachers

- Action research booklet
- Resources sheets
- Learning activity sheets
Discussion

What are barriers to organising inclusive events?