Teaching science communication to physics students

Wendy Sadler

@wendyjsadler

sadlerwj@cardiff.ac.uk
Cardiff physics/music graduate
Techniquest education manager
MSc Science communication
Founding Director *science made simple*
19 books on Amazon
TV/Radio regular
Government advisor on STEM issues
10 credit optional module
1st and 2nd years

- 1st years: 72%
- 2nd years: 28%

32 students in total

19% female, 78% male
Presentation skills

communication theory
audience engagement tools
learning styles
vocal skills and body language
using props and AV resources

Assessed by 3-minute presentation - 25% - Panopto

Writing and the media

basic journalistic skills
critical analysis of news sources
interview skills
research skills
radio formats and podcasting

Assessed by magazine article/blog about research
25%

Formats and audiences

creative formats for outreach
science centres and museums
field trip and exhibit analysis
evaluation techniques
peer-review practice
project management skills

Assessed by proposal and pitch to panel - 50%

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Key skills

- Understanding physics
- Presentation skills
- Creativity
- Communication skills
- Interpersonal skills
- Professionalism
- Writing skills
- Problem solving
- Project management
- Team working
- Time management

Career paths

- teacher
- journalist
- policy maker
- entrepreneur
- researcher

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<table>
<thead>
<tr>
<th>Wk</th>
<th>Date</th>
<th>Description</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31 Jan</td>
<td>Introduction to module and context for public engagement.</td>
<td>Set assessment 1: 3 minute presentation</td>
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<tr>
<td></td>
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<td>Introduction to presentation skills</td>
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<tr>
<td>2</td>
<td>7 Feb</td>
<td>Presentation skills part II. Slide design, audience interaction, voice and body skills. Using props safely.</td>
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<tr>
<td>3</td>
<td>14 Feb</td>
<td>Delivery of short presentations – to be videoed</td>
<td>Deliver assessment 1</td>
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<tr>
<td>4</td>
<td>21 Feb</td>
<td>Introduction to science in the media. Where do science stories come from and how credible are they</td>
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<tr>
<td>5</td>
<td>28 Feb</td>
<td>Developing science writing skills – interviews with researchers which is required for assessment 2 content</td>
<td>Feedback from assessment 1 Set assessment 2</td>
</tr>
<tr>
<td>6</td>
<td>7 Mar</td>
<td>Science on the radio and podcasts - Guest lecture Chris North and Rhys Phillips (Radio Cardiff)</td>
<td>Feedback from assessment 2 Submit assessment 2</td>
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<tr>
<td>7</td>
<td>14 Mar</td>
<td>Creative methods and formats used for engagement</td>
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<td>Introduction to IOP grant scheme for final assessment.</td>
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<td>Introduction to Techniquest – exhibit observation exercise</td>
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<tr>
<td>8</td>
<td>21 Mar</td>
<td>Science centres, museums and exhibits as communication tools</td>
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<td>Group planning time</td>
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<tr>
<td>9</td>
<td>28 Mar</td>
<td>Field trip to Techniquest – exhibit observation exercise</td>
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<tr>
<td>10</td>
<td>4 April</td>
<td>Overview of evaluation methods for engagement to help with final assessment.</td>
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<td>Group planning time</td>
<td></td>
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<tr>
<td>11</td>
<td>11 April</td>
<td>Delivery of group presentation on proposals for public engagement projects to assessment panel</td>
<td>Submit assessment 3: Group project</td>
</tr>
</tbody>
</table>
Mistakes made

Too many guest lecturers, appreciated by some, but leading to inconsistent styles of delivery

First and second years’ assessment was identical – but second years were more mature in their reflective approach

Too many assessments coming at the end of the course in proximity to exams

@wendyjsadler
What the students said...

“It pushed us out of our comfort zone”

“It was the only module outside of labs that encouraged group work”

“My favourite module – it really helped my employability skills and general confidence”

“Different to the usual math-porridge blandness”
Teaching science communication to physics students

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Engaging our students with engagement
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What’s the story?
Over the last 20 years there has been a steady growth in the number of physics outreach and public engagement initiatives with the aim of addressing the falling number of UK students choosing physics at HE level.

In parallel there is a chronic shortage of specialist physics teachers in schools, and a need to encourage more physics graduates to consider using their skills to inspire the next generation of scientists and engineers.

Cardiff School of Physics and Astronomy has a long history of outreach and engagement activities with a number of large-scale projects running within the school, and an award-winning science communication company – science made simple - who work in partnership with their researchers and students.

A new free-standing module called ’Engaging Physics’ was developed to share this in-house expertise and increase the employability skills of our students. The course was offered to first and second year students for the first time in the academic year 2015-16.

This poster gives an overview of the course content, shares some of our learning on the successes and failures, and identifies the changes we will make to the course in the coming year.

Core topics covered

Verbal presentations

Students learn about the theory of communication and learning styles to better understand how to create more engaging presentations. Practical sessions include vocal and body language skills, and how props and AV resources can be used more effectively. Skills are assessed with a peer-reviewed 3-minute presentation, which is video recorded to enable the students to self-reflect on their own performance.

Writing and the media

Sessions within this topic include basic writing skills for different audiences, guidelines on the use of reading-score tools to help get the correct level of information, and an exploration of science in the media. We feature two guest lecturers from the School of Journalism and Radio Cardiff, and the students make a mock radio programme in small groups. They are assessed on a magazine article about physics research from the School, which is written for a general-interest audience.

Formats and audiences

During the 11-week course the students explore the various formats used to address the different issues and audiences for public engagement. There is a practical case-study assessment on a local science centre – Techniquest - through a field trip where students critically evaluate the interactive exhibits. As a final assessment they then work in groups to prepare a proposal for the IOP Public Engagement grants scheme. They must create the ideas, plan a budget, set out evaluation criteria and then pitch the idea to a mock panel.

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Changes planned for 16-17

- Differentiated assessment for 1st and 2nd years
- Add reflective journal to create more opportunities for feedback and reflection
- Opportunity to extend ideas into 3rd year outreach projects

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Who took the course?

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1st years 72%

2nd years 28%

*1 person declined to answer

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