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Introduction

A message from the Lead Advisor

The Research Integrity (RI) programme is designed to provide postgraduate students, new faculty and research staff with a basic understanding of responsible research practices in their area of study.

Researchers are expected to set high standards for integrity in all aspects of their work. Some, unfortunately, do not. Small numbers engage in major misconduct; larger numbers from time to time fail to follow best practices.

The first step towards responsible practice is knowing what is expected. Research is a complex activity, directed by many rules, guidelines and so-called ‘commonly accepted practices’. Researchers are not routinely introduced to best practices, making it difficult to know what is expected. This is particularly true for researchers in training, new faculty and research staff.

The RI programme provides a common framework and content for learning and thinking about responsible professional behaviour in research. If adopted widely at your institution, it will help ensure that your researchers:

- Know the basics
- Know where to get more information
- Know your institution’s expectations for integrity and responsibility in research.

This Supplement is provided as an accompaniment to the online RI programme to help you build an effective and comprehensive research integrity programme for your institution, which will not only support and deepen researchers’ understanding of their responsibilities, but also communicate the importance and value that your institution places on this aspect of their research. It is important that researchers know about their responsibilities, but they will be more inclined to translate this knowledge into corresponding responsible behaviour if they know that their institution cares.

The Supplement opens with a sequence of key questions you need to ask when you implement the RI programme. They are followed by over 50 pages of additional material that your students, researchers and faculty can use to carry on this discussion.

I wish you and your staff every success with the use of this programme. For further updates and information, you can visit the support pages on the Epigeum website (www.epigeum.com).

Nicholas H. Steneck, Lead Advisor
Professor Emeritus of History and
Director of the University of Michigan MICHRI Research Ethics and Integrity Programme
Welcome to the *Research Integrity Supplement*, which is designed to support, extend and inform institutions’ use of the online course programme. It is divided into three main sections:

**Section 1: Implementation for course leaders**
This section is for those who are in charge of running the *RI course* at their institution and are responsible for monitoring the participants\(^1\) of the course. This section contains:

- A general introduction to the components of the *Research Integrity* programme and to which version of the course covers which subject area
- Guidelines on the key decisions you need to make on how to integrate the *Research Integrity* programme into your existing training provision
- Advice on how to ensure that your target audience knows about the programme and can access it easily so that it attracts users and is well supported by your institution
- Suggestions on how to gather feedback and evaluate the effectiveness of the programme.

**Section 2: Installing the courses in your VLE**
This section is for those who are in charge of the technical implementation of the courses on your institution’s VLE. It contains links to online support videos to help your IT team with every aspect of installing and customising the courses to your institution’s particular needs and preferences.

**Section 3: Supplementary activities**
This section contains over 15 hours of additional material written by the authors to accompany their courses, and is divided into three parts:

- An overview of the material available to help you map it against the online course content
- An extensive range of tutor-led and peer-to-peer communicative activities
- A set of additional essay/case study suggestions to extend and potentially assess learning.

This Supplement is available in both Word and PDF form – the former so that you can extract and edit the activities should you so wish. If you are viewing the Supplement in Word document form, you may find navigation easier with the ‘Document map’ enabled (go to the ‘View’ toolbar and check ‘Document map’). You can then move between sections using the left-hand navigation bar.

* * * * *

**The Epigeum 11-stage Implementation Method**
Epigeum courses can be used in a wide variety of different ways – in fact, no two institutions have yet implemented the courses in exactly the same way.

Epigeum has developed an 11-stage method covering all aspects of implementation – from developing the initial vision through to resourcing and timelines (see box to the right for an overview). This Supplement covers some highlights and key areas, focusing in particular on steps 3, 4, 8 and 9.

For a more in-depth training session covering all eleven stages, or for answers to any other implementation-related questions, please do contact our Senior Learning Consultant, Ben Hutchens, on ben.hutchens@epigeum.com.

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1 The term ‘participant’ is used in this Supplement to mean individuals who are taking the *Research Integrity* program.
### Components of the Research Integrity programme

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Approx. duration per course</th>
<th>Where can I find this material?</th>
</tr>
</thead>
</table>
| **Self-study course**      | **Core online component:** The core of the *Research Integrity* programme is the self-study course, available in five different track versions:  
|                            | - Biomedical Sciences  
|                            | - Natural and Physical Sciences  
|                            | - Engineering and Technology  
|                            | - Social and Behavioural Sciences  
|                            | - Arts and Humanities  
|                            | Each version of the course consists of a series of screens (webpages) containing text, video and activities. | 4–5 hours | Download from [www.epigeum.com/downloads/course_s_for_download/ri/ri_list.html](http://www.epigeum.com/downloads/course_s_for_download/ri/ri_list.html) (Username: researchintegrity  
|                            |                                                                            |                            | Password: rid0wnl0adpag32805)                                                                 |
| **Optional activities**    | **Additional online component:** Optional activities are placed on the right-hand side of the screens within the online self-study course. They provide the opportunity for participants to reflect further and to relate the topic of a screen to their own context. They can be completed by users independently and do not require a tutor or customisation. | 11–13 hours | For further information on installing the courses, see Section 2 of this Supplement. |
| **Communicative activities** | **Additional content:** These activities are *not* contained in the core online component. Instead, they are optional additional content, contained in this *Supplement* and designed to accompany and augment material worked through in the self-study course. There are two types of communicative activity:  
|                            | - Peer-to-peer activities, which encourage participants to interact with one another and share experiences through VLE-hosted discussion boards  
|                            | - Tutor-led activities, which are designed to be led by a tutor, and include topics for workshop discussions and assignments.  
|                            | These activities can be incorporated by universities throughout the RI programme according to their requirements. | 13–17 hours | Section 3 of this *Supplement* (either PDF or Word document form) |
| **Assessment materials**   | **Additional content:** This optional additional content is contained within the *Supplement*, and comprises:  
|                            | - Multiple-choice questions  
|                            | - Essay questions and case studies | 15 MCQs and 10 essay questions |                                                                                                  |

A *Table of additional activities* is provided later in this guide to show where the optional and communicative activities map onto the screens in the self-study course.

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2 The variation in durations cited in this column reflects the slight variation in the length of each course. Biomedical Sciences and Social and Behavioural Sciences are the longest courses as they have the most in-depth coverage of research with human participants and animals; in the other tracks this material is abbreviated (though it can still be accessed as supplementary content).
Which course covers what

The following table outlines the subject areas covered by the five track versions of the *Research Integrity* programme. Note that throughout all five tracks, case studies and examples are used for illustrative purposes only; it is up to the reader and those guiding their professional development to consider how the key issues relate to their own specific research activities, and many prompts are provided within each course to encourage this type of reflection.

<table>
<thead>
<tr>
<th>Biomedical Sciences</th>
<th>Natural and Physical Sciences</th>
<th>Engineering and Technology</th>
<th>Social and Behavioural Sciences</th>
<th>Arts and Humanities</th>
</tr>
</thead>
<tbody>
<tr>
<td>The material in this course is relevant to researchers in the many branches of the Health Sciences.</td>
<td>The material in this course is relevant to researchers in the Natural and Physical Sciences, including such fields as listed below.</td>
<td>The material in this course is relevant to researchers in Engineering and Technology, including such fields as listed below.</td>
<td>The material in this course is relevant to researchers in the Social and Behavioural Sciences, including such fields as listed below.</td>
<td>The material in this course is relevant to researchers in the Arts and Humanities, including such fields as listed below.</td>
</tr>
<tr>
<td>Dentistry</td>
<td>Agriculture and Agronomy fields such as Animal Science, Crop &amp; Soil Sciences, Forestry &amp; Horticulture</td>
<td>All Engineering Disciplines</td>
<td>Anthropology</td>
<td>Archaeology</td>
</tr>
<tr>
<td>Kinesiology and Sport Medicine</td>
<td>Biochemistry</td>
<td>All Engineering Technology Disciplines</td>
<td>Economics</td>
<td>Area and regional studies</td>
</tr>
<tr>
<td>Medicine</td>
<td>Chemistry</td>
<td>Computer Science</td>
<td>Education</td>
<td>Classics</td>
</tr>
<tr>
<td>Nursing</td>
<td>Ecology</td>
<td>Engineering Science</td>
<td>Management/Business</td>
<td>Cultural and media studies</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Entomology</td>
<td>Engineering Physics</td>
<td>Political science</td>
<td>English language and literature</td>
</tr>
<tr>
<td>Public Health</td>
<td>Evolutionary Biology</td>
<td>Information Technology</td>
<td>Psychology</td>
<td>Fine arts and design</td>
</tr>
<tr>
<td>Joint medical/health programmes, such as Biomedical Engineering</td>
<td>Fisheries &amp; Wildlife</td>
<td>Information Systems</td>
<td>Public affairs</td>
<td>History</td>
</tr>
<tr>
<td>Associate Health Degree Programmes</td>
<td>Food Science &amp; Human Nutrition</td>
<td>This course could also be taken by researchers in the applied or more mathematical physical sciences, such as chemistry, physics or geology.</td>
<td>Social work</td>
<td>Law</td>
</tr>
<tr>
<td></td>
<td>Genetics</td>
<td></td>
<td>Sociology</td>
<td>Modern languages and literature</td>
</tr>
<tr>
<td></td>
<td>Geological Sciences</td>
<td></td>
<td></td>
<td>Music and musicology</td>
</tr>
<tr>
<td></td>
<td>Mathematics</td>
<td></td>
<td></td>
<td>New media and animation</td>
</tr>
<tr>
<td></td>
<td>Microbiology</td>
<td></td>
<td></td>
<td>Performance arts</td>
</tr>
<tr>
<td></td>
<td>Molecular Biology</td>
<td></td>
<td></td>
<td>Philosophy and history of ideas</td>
</tr>
<tr>
<td></td>
<td>Pharmacology &amp; Toxicology</td>
<td></td>
<td></td>
<td>Theatre and film studies</td>
</tr>
<tr>
<td></td>
<td>Physics</td>
<td></td>
<td></td>
<td>Theology and religious studies</td>
</tr>
</tbody>
</table>
Key implementation decisions

From a pedagogical perspective, the courses in the Research Integrity programme can be implemented in a number of different ways, starting with a straightforward ‘plug and play’ (where courses are simply installed and used as they are) and moving through various levels of customisation and tutor input.

Our strong recommendation for institutions using the Research Integrity programme is that they spend some time considering the key questions outlined below in order to make sure that it is implemented as effectively as possible for their particular context. Time spent planning and tailoring your implementation strategy early on will pay dividends in terms of the effectiveness of the courses.

The key questions covered are:

1. Stand-alone or with additional materials and support?
2. Online or blended?
3. With or without communicative activities?
4. With or without tutors?
5. With or without customisation?
6. In what order?
7. How to make best use of the research integrity portfolio?
8. How to assess learning?
9. How to encourage further study?

Don’t hesitate to contact Epigeum or arrange to attend one of our implementation workshops if you would like to explore any of these issues in more detail than is covered below.

Stand-alone or with additional materials and support?

**Stand-alone**

The courses in the Research Integrity programme can be used as stand-alone training, without any additional engagement. If course participants are sufficiently motivated, we are confident that they will learn a great deal about the principles and values of research integrity through the core course content alone – particularly if they complete the ‘Optional activities’ that are contained in the right-hand boxes placed throughout the online course. Not offering any additional learning opportunities, whether online or in person, also keeps costs to a minimum.

**With additional materials and support**

The primary disadvantage of stand-alone online training is the message it sends about institutional commitment. If participants are left to learn this material on their own without any input and guidance from peers, mentors, and tutors, does their institution and do colleagues really believe it is important? Today it is well recognised that integrity in research is taken more seriously if it is seen as a widely embraced professional commitment.

In this supplement, we have therefore provided additional materials and advice to help you develop an extensive research integrity programme that:

- Supports and extends participants’ understanding of the responsible conduct of research
- Engages participants in discussion and debate with other researchers, under the guidance of a tutor.

If you decide to extend and supplement your Research Integrity offering in this manner, we would suggest using the core online courses as background preparation for workshops/webinars, or as the framework for fuller courses. In the core online course we have carefully mapped out the basic content that needs to be covered. Use the additional 24–30 hours of online and in-person materials we have provided in this Supplement to develop a challenging research integrity programme.
The remainder of the questions in this section set out the options available if you do choose to enrich the Research Integrity programme by providing additional materials and support.

Q2: Online or blended?
The additional materials and support you provide could be delivered face-to-face, online, or as a combination of the two.

Online
The primary advantages of the completely online approach are convenience and cost. Purely online courses are convenient because participants can take them at a time and place of their choosing. This is particularly advantageous if participants are not in one central location (as is often the case with research collaborators) or if they tend to be busy at the times when teaching sessions are held (e.g. actively engaged researchers and staff).

Although by definition the online-only approach excludes face-to-face teaching, it can still include peer-to-peer interaction (for example, through discussion boards or webinars) and online tutor support, as is outlined in Questions 3 and 4 below.

Blended
By ‘blended’ we mean combining the online course content with face-to-face teaching and learning. Face-to-face contact is now recommended in the U.S. but also generally encouraged as important for developing strong professional commitments to integrity. The blended approach is more demanding in terms of time and resources, but may be more effective in promoting the responsible conduct of research.

Q3: With or without communicative activities?
The aim of the communicative activities (which are included in Section 3 of this Supplement) is three-fold:

- To facilitate dialogue between course participants
- To provide ideas for activities and workshop sessions (the ‘tutor-led’ activities)
- To provide opportunities for assessment beyond the objective questions included in the core course files.

The communicative activities represent a substantial body of additional material (15+ hours per subject track) to support and extend learning and, as mentioned above, can be used to extend the online course or as a basis for face-to-face contact time.

While the courses can operate independently of them, we would strongly recommend that, as a minimum, institutions spend time (not much is required!) to add them in online form throughout the courses in line with their needs. Further advice on how to implement the communicative activities can be found:

- In Section 2 and at www.epigeum.com/downloads/ri_guide, which includes guidelines on how to add the activities from a technical perspective
- In Section 3, which includes a complete index of activities and where they slot into the five modules of the core online course.

Q4: With or without tutors?
Courses in the Research Integrity programme have been designed to work either with or without tutors. Again there are advantages to both approaches.

Without tutors
As mentioned, individual participants can work their way through the courses entirely on their own, independently, without intervention, tutors or customisation. Using the courses in this manner enables participants to study at a time of their choosing and at little additional cost in terms of your time and money.
With tutors

Having tutors helps improve the effectiveness of the courses by:

- Prompting reflection and discussion of individuals’ particular research contexts
- Discussing case studies and problems and exploring/sharing ideas for appropriate courses of action
- Getting feedback from an expert on research plans.

These kinds of processes are introduced to participants in the optional activities that appear throughout the programme – but they are more likely to take place if a tutor initiates and manages them to some extent. This can be done either face-to-face or online:

- **Face-to-face meetings involving a number of participants**: As mentioned above, many of the communicative activities can be used as a basis for face-to-face discussion. The online courses also include video examples, video interviews with participants and students, and case study material – all of which could usefully be viewed and discussed in a meeting.
- **Online discussion with individual participants**: If you can establish online contact right at the start, and maintain it through regular light nudges, the courses are much more likely to be successful. There are activities specifically designed to prompt and support online teaching and learning in every course, but this kind of tutor role is as much about encouragement and reducing the loneliness of the long-distance learner as it is about being an expert on integrity in research.

In addition, tutors (whether online or face-to-face) can:

- Track participants’ progress through the courses, assisting them as they get started, motivating them to reach the end and encouraging further study
- Respond to participants’ questions on the material, both through asynchronous tools such as discussion boards and also by scheduling online office hours
- Enable the tutor-led communicative activities to be used
- Carry out more nuanced assessment of participants’ learning, through their research portfolios and participation in discussion and workshops/webinars (see below)
- Distribute reports on participation to stakeholders.

Q5 With or without further customisation?

As well as incorporating communicative activities, your licence agreement for the Research Integrity programme also allows you to customise the courses in other ways – specifically:

- **Deleting pages** (e.g. if certain pages are less relevant to your particular context)
- **Adding your own pages** (e.g. to include your institution’s information and branding at the start of the course or to add extra case studies or material in line with your particular syllabus. We do ask that you make it clear that these are your own work, and not the authors’)
- **Moving pages** (e.g. if you feel that certain sections are high priority and should be moved forward in the course)
- **Editing the resource bank** (e.g. to include links to your institution’s staff development department or handbook)
- **Editing the ‘Your context’ pods**.

Customising the programme in this manner will ensure that it is as appropriate as possible for your particular context. More specific information on selected customisation options is included below. If you would like to customise the material beyond the steps outlined above, then please [contact us](mailto:contactus@epigeum.com). We try to be flexible.

‘Your context’ boxes

Throughout the RI programme you will find ‘Your context’ boxes in the right-hand margin, suggesting that participants research and locate their local policies and relevant personnel. These boxes have been specially designed so that they can be customised to contain links and information particular to your needs.
We would strongly recommend customising the ‘Your context’ pods with links to national, institutional, departmental or subject-specific information relevant for your researchers.

Details on how to do this are provided in Section 2, and a summary of the locations and suggested content of the ‘Your context’ pods is provided in the table below for ease of reference.

Once you have inserted this information at relevant points throughout the course, we also recommend that you provide a single, complete list of institutional and specific policies in summary form at the end of the course, within the ‘Closing’ section (for example, after the ‘Guide to research policies and guidelines’). You can do this by inserting a new page – see Section 2 for further information on how to do this.

<table>
<thead>
<tr>
<th>List of ‘Your context’ pod locations and content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screen</strong></td>
</tr>
<tr>
<td><strong>Orientation section</strong></td>
</tr>
<tr>
<td>Welcome</td>
</tr>
<tr>
<td><strong>Introduction module</strong></td>
</tr>
<tr>
<td>Principles and responsibilities</td>
</tr>
</tbody>
</table>
| Responding to research misconduct | ➢ **Guidelines and policies**: misconduct and whistleblowing  
 ➢ **Personnel**: institutional research integrity officer’s (RIO) contact details  
 ➢ **Information**: funding agency information on research misconduct |
| Research training and professionalism | ➢ **Information**: mentoring schemes |
| **Planning module** | |
| Research with human participants: Definitions | ➢ **Definitions**: ‘research’ and ‘human participant’ |
| Research with human participants: Key principles* | ➢ **Guidelines and policies**: rules governing research with human participants |
| Research with human participants: Getting approval* | ➢ **Forms and information**: how to initiate the approval procedure for research with human participants |
| Research with animals: Your context* | ➢ **Guidelines and policies**: use of animals in research |
| Financial interests and intellectual property | ➢ **Guidelines and policies**: conflict of interest and intellectual property |
| Workplace and environmental safety | ➢ **Guidelines and policies**: responsible workplace safety |
| Module summary | ➢ General opportunity to link to other policies relating to the areas covered in this module |
| **Conducting module** | |
| Research record | ➢ **Guidelines and policies**: research record maintenance |
| Research data | ➢ **Guidelines and policies**: data storage  
 ➢ **Guidelines and policies**: data sharing and security |
| **Reporting module** | |
| Plagiarism | ➢ **Guidelines and policies**: plagiarism |
| Authorship | ➢ **Guidelines and policies**: authorship |
| **Responsibilities to society module** | |
| Advocacy | ➢ **Guidelines and policies**: advocacy and expert witnesses |
| Responsibility to society | ➢ **Guidelines and policies**: dual use |

* Indicates that this screen appears in selected subject track versions of the Research Integrity programme only. (For example, the ‘Arts and humanities’ track includes less detailed information on research with human and animal participants.)
Course quizzes
A further element of customisation we recommend you perform is to convert the course quizzes from the default HTML format to your VLE format. This enables you to make use of the more sophisticated functionality offered by your VLE.

<table>
<thead>
<tr>
<th>Default format</th>
<th>Customised format</th>
<th>Benefit of customisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes will not be tracked via your VLE</td>
<td>Quizzes can be tracked via your VLE</td>
<td>You can gain valuable information regarding the participation and performance of those who have taken the courses</td>
</tr>
<tr>
<td>Same set of 15 questions will appear every time the quiz is taken</td>
<td>Quiz questions will be drawn from test item file of 45 questions</td>
<td>Participants will not be able to pass the test by ‘learning’ the answers to the quiz, as the quiz will be different each time</td>
</tr>
</tbody>
</table>

For information on the technical aspects of customising these courses, please see Section 2 and the technical implementation section on the Epigeum website (www.epigeum.com/about-our-courses/technical-information).

Q6 In what order?
The five modules that make up each course have been designed to form a coherent whole that works through the research process sequentially from start (planning) to finish (publication). However, if you have a particular cohort of participants with specific needs, you may wish to select particular modules or revise the order.

The two main options are:

- Planning for an entire cohort to be studying the same materials at the same time, so that they can communicate with each other about them. The communicative activities (mentioned above and in Section 3) prompt online interaction with others, but in order for them to be useful, there need to be others who are doing much the same thing at much the same time.
- Enabling participants to learn what they need to ‘just in time’, i.e. when they are facing a particular challenge or have reached a particular point in the research process.

The courses can be used for ‘troubleshooting’ as outlined in the second option above, but their real value lies as part of a coherent whole which orientates researchers in all aspects of responsible behaviour in their context.

Q7 How to make best use of the research integrity portfolio?
Many of the ‘Optional activities’ in the online courses generate material that participants may wish to include in a ‘research integrity portfolio’. These are indicated by the icon shown to the right, and a full blank portfolio template is available for participants to download and fill in as they work through the course.

The resulting portfolio can be used either as a learning tool, or as evidence that can be submitted to gain recognition, course credit or professional accreditation.

In default mode, participants are encouraged to take advantage of these opportunities. When implementing the courses you may want to determine a policy regarding the research integrity portfolio and communicate this to those taking the course. For example, selected elements of the portfolio (or indeed, the whole thing) could contribute towards the assessment of your training programme.

If you are planning to use the courses with tutors (see above) then they can encourage participants to begin on their research integrity portfolio as soon as they start work on the programme. Tutors can also provide feedback on draft sections of a portfolio and could convene meetings between participants who are at a similar stage of developing their portfolio, to share and discuss the experience and how to make the most of it.
How to assess learning?

Multiple-choice quizzes
- The multiple-choice quizzes at the end of each course are the default assessment mode\(^1\). If you are using the Research Integrity programme without tutors (see above), this is generally the best option. Don’t forget to customise the end-of-course quiz so that the questions are selected from the testbank of 45 questions rather than the default setting of 15 (see above).
- In Section 3 you will also find a set of three additional multiple-choice questions for each module of the course. These can be inserted at the end of each module within your VLE and, if you wish, set so that participants must answer them correctly before continuing.

Activities, portfolio and assignments
When tutors are present, other methods can be used to provide additional and perhaps more nuanced opportunities to assess learning:
- The communicative activities (see above and Section 3)
- The research integrity portfolio (see above)
- The additional essay/case study suggestions (see Section 3).

How to encourage further study?
Each course lists additional resource materials for those who would like to read more and explore beyond the core course content. Some of these sources might not be easy for participants to get hold of. Tutors can provide useful support by making available additional reading material – either what is listed in the courses or their own favourites.

\(^1\) Please note that, due to the fact that some institutions will want to use the end-of-course quizzes for official assessment and credit, we are unable to provide accessible/print versions of the quizzes, as these would reveal the correct answers. We would be happy to discuss options for providing the course quizzes to participants at your institution who are unable to use the interactive functionality and to provide support on a case-by-case basis.
Marketing and encouraging uptake

The Research Integrity programme can be used as an off-the-shelf solution to training in the responsible conduct of research: courses can be downloaded and installed directly on to your VLE and are then ‘ready to go’. However, the best way to get the most out of the programme is to spend some time planning a strategy for course implementation. As well as considering the questions in the previous section, you also need a plan for:

- How to secure buy-in from key project stakeholders
- How you will ensure that the courses reach those who need them.

Planning a strategy for implementation

Your decisions at this stage will have the largest impact on the rate of participant adoption.

1. Raise awareness with departments and other stakeholders
   Securing the support of stakeholders at an early stage is a key way to ensure that you get the most out of the courses and that they are implemented in the best way to benefit your institution (see diagram below). Input from stakeholders will be important to help you decide the rest of your implementation strategy.

2. Choose whether to run a pilot or to roll all courses out immediately
   This will largely be determined by the immediacy of the demand for the training at your institution. If you have the time, a pilot study is an effective way to troubleshoot and refine your use of the courses.

3. Choose your delivery mode – blended learning or purely online
   The courses are designed to function as stand-alone units; however they can be particularly effective when used as part of a blended approach to staff development (for further information, see ‘Key implementation decisions’), allowing more time for detailed and higher level discussion in face-to-face workshops.

4. Adaptation
   As we have already seen, courses can be adapted to your context. Add your own university logos, livery and links to give the courses the feel of a home-grown product.

Securing commitment of time and support from stakeholders

We have seen courses sit unused for over a year because key stakeholders have failed to give prior commitment of support. The diagram below gives some advice on how to avoid this happening at your institution.
Incentivising participation

✓ Participants work best when there is an incentive. For example, you could give a certificate or course credits to those who have completed the courses. This sends the message that your institution takes the programme seriously and will significantly increase uptake rates.

✓ Use your department stakeholders – encouragement and direction from the top will also increase the level of adoption.

Following good practice for marketing and web promotion

✓ Ensure that your target audience knows about the Research Integrity programme and can access the courses easily.

✓ Advertise links to the courses prominently on your VLE. The general principle for web browsing is that users have an attention span of ‘three clicks’ to be taken to information.

✓ Give your online courses as much promotional prominence as your face-to-face workshops.

✓ Incorporate awareness of the availability of the online courses into induction training for new staff.

Epigeum is on hand to help you with promoting the Research Integrity programme within your institution. We run implementation workshops (both online and face-to-face) in which we share our experiences of effective marketing. We can also provide you with marketing material such as posters and hand-outs. Please contact us for more information.

Launching the programme

✓ Set a date to officially ‘launch’ the online courses at your institution. Include this date in any web promotion.

✓ Follow up the launch with email promotion to potential users.

✓ Ask the course tutor(s) to send out an email to potential users recommending the Research Integrity programme and highlighting its importance and how it relates to any upcoming workshops.
**Feedback, evaluation and refinement**

Once the courses in the Research Integrity programme have been implemented, a range of tools are available to help you monitor and evaluate their effectiveness.

### Monitoring course usage

- **A VLE monitoring system** can indicate whether a student has opened a course page, and how long that page has remained open.
- **The final course quiz** screens in Epigeum courses can be adapted on your VLE so that the results can be monitored and stored within assessment systems.

This data will give you information about usage and student engagement with the material. It will show which sections are popular and successful with participants, and which might need further adaptation and support from workshops.

### Gathering feedback

A sample ‘Course feedback questionnaire’ is provided on the next page, and can also be downloaded, customised to your needs, and installed directly on to your VLE.

The questionnaire will allow you to track and gather useful data about the user experience of Research Integrity.

It is also important to keep in touch with your key stakeholders and to gather feedback from course leaders and heads of department about the effectiveness of the online courses.

### Refinement

Universities sometimes cite three years as the time needed to achieve a ‘steady state’ for a new e-learning programme. Monitoring, evaluating and refining the usage of the course will ensure that your institution continues to get the best from the Epigeum programme.

### Helping Epigeum gather feedback

As well as helping you refine your use of courses internally, feedback can also greatly assist Epigeum in planning improvements to the programme.

As a default setting, each course in the RI programme includes a link to an ‘Optional course evaluation’ form (similar to the one included on the next screen) in a box within the ‘Course summary’ screen. Information collected via this form is gathered centrally by Epigeum and used to help shape future updates and modifications to the programme. All information collected is completely anonymous.

If you would prefer to gather and analyse your own institution-specific feedback, then the ‘Optional course evaluation’ pod can be removed and replaced with a link to your own evaluation form. If you choose to do this, Epigeum would be most grateful if you could pass on any suggestions for improvements to the programme arising from the feedback you receive from participants at your institution.

Epigeum will continue to support your institution by providing you with updates to the courses as and when they are released.
Sample course feedback form

This questionnaire is available to download and install on your intranet, and can be used to replace the default questionnaire that appears on the ‘Course summary’ screen.

1. What was your overall impression of the course?

5  Very positive  
4  Positive  
3  Adequate  
2  Negative  
1  Very negative

Comments:

2. How effective was the course in improving your understanding of the subject?

5  Very effective  
4  Effective  
3  Adequate  
2  Ineffective  
1  Very ineffective

Comments:

3. How relevant was the course to you and your needs?

5  Very relevant  
4  Relevant  
3  Adequate  
2  Irrelevant  
1  Completely irrelevant

Comments:

4. How clear, coherent and easy to follow was the course?

5  Always very clear and easy to follow  
4  Usually clear and easy to follow  
3  Adequate  
2  Sometimes unclear or hard to follow  
1  Frequently unclear or hard to follow

Comments:
5. What did you think of the quality and frequency of the interaction and activities throughout the course? *(For example, was the interaction enjoyable/relevant/helpful to learning, or inadequate/overbearing/boring/irrelevant/window dressing?)*

5  Excellent
4  Good
3  Adequate
2  Poor
1  Very poor

Comments:

6. How much did you feel the videos added (or did not add) to the learning experience?

5  Very positive effect
4  Positive effect
3  No real impact either way
2  Negative effect
1  Very negative effect

Comments:

7. What did you think about the amount of information presented on each screen in the course?

5  Much too much material on each screen
4  A bit too much material on each screen
3  Just right
2  A bit too little material on each screen
1  Much too little material on each screen

Comments:

8. Did the course take less or more time than you expected to complete? Do you think it ought to be lengthened/shortened? *(Select all that apply.)*

- Course was too long
- Course was too short
- Course was the right length
- Course took longer than expected
- Course took less time than expected
- Course was the length I expected

Comments:
9. What did you think of the design, look and feel of the course?

5  Excellent
4  Good
3  Adequate
2  Poor
1  Very poor

Comments:

10. The following statements relate to the learning outcomes set out at the start of the course. Select all statements that are true now that you have completed the course.

- I understand and can explain the key responsibilities I have as a researcher.
- I can identify the challenges I might face in meeting these responsibilities.
- I can apply a range of strategies to deal with the challenges I may face.
- I have gained a better understanding of the importance of responsible conduct in research and this is likely to influence my behaviour in future.

Comments:

11. Do you have any general comments about the course or any specific suggestions as to how we can improve it? (e.g. expanding or reducing certain sections, adding new interactive features or functions, etc.)

Positive comments:

Suggestions for improvement:

12. Tick any statements that apply.

- I have taken this course because it was mandatory.
- I have taken this course because I thought it was important.
- I would recommend to others in my position that they took this course.

Comments:
Section 2: Installing the courses in your VLE

Installing the courses in your VLE

The link below is to our online guide which gives you all of the information you will need to successfully install the Epigeum courses into your VLE. The online guide gives system-specific information and step-by-step instructions on how to:

- Install a course package
- Install a quiz unit
- Add and remove screens
- Customise the existing ‘Your context’ pods, and add new ones
- Add a discussion forum (for use with the communicative activities)
- Customise the end-of-course quiz so that it selects questions from the testbank item file.

The guide also has a section outlining which parts of the course you can customise, and how to do this.

RESEARCH INTEGRITY INSTALLATION GUIDE

www.epigeum.com/downloads/ri_guide
Section 3: Supplementary materials

>>> Overview of additional material

As noted previously, the following supplementary material is provided to support your use of the Research Integrity programme:

- **For each module:**
  - A set of multiple-choice questions (found within this Supplement)
  - Suggested essay/case study activities (found within this Supplement)

- **For selected screens:**
  - Optional activities (found in right-hand boxes within the core online course)
  - Communicative activities (found within this Supplement)

To help you make sense of this additional content, we have prepared a table which maps the location of all optional and communicative activity content against individual course screens.

- **Optional activities** are embedded within the online courses within the screens indicated in the grid.
- **Communicative activities** are provided within this Supplement, and can be customised and incorporated into the courses to support the requirements of your institution.

For convenience, we have also indexed the customisable ‘Your context’ pods within this table.

**Key**
- * Indicates that this screen appears in selected subject track versions of the Research Integrity programme only. (For example, the ‘Arts and Humanities’ track includes less detailed information on research with human participants and animals.)
- (60) Approximate activity length in minutes
- [RP] Indicates that completion of the optional activity results in documents to add to the participants’ Research Integrity Portfolio
- [CTL] Communicative tutor-led activity
- [CP2P] Communicative peer-to-peer activity

<table>
<thead>
<tr>
<th>Module / Screen title</th>
<th>Optional activities (located online)</th>
<th>Communicative activities (located within this Supplement)</th>
<th>Your context pods (located online)</th>
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<tr>
<td>Introduction</td>
<td>Portfolio template download [RP]</td>
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<tr>
<td>MODULE 1: INTRODUCTION</td>
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<tr>
<td>Welcome</td>
<td></td>
<td>Justifications and motivations for research behaviour [CP2P] (60)</td>
<td>Definitions: ‘research misconduct’, ‘QRP’ and ‘RCR’</td>
</tr>
<tr>
<td>Principles and responsibilities</td>
<td></td>
<td>A code of conduct for your context [CTL] (30)</td>
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<td>Responding to research misconduct</td>
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<tr>
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<td><strong>MODULE 2: PLANNING</strong></td>
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<td>Planning your research</td>
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<td>Reflection on key ideas</td>
<td>Definitions: ‘research’ and ‘human participant’</td>
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<tr>
<td>Research with human participants: key principles*</td>
<td>What makes research ethical</td>
<td>Guidelines and policies: research with human participants</td>
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<tr>
<td>Research with human participants: getting approval*</td>
<td>The ethics of REC review</td>
<td>Forms and advice: the approval process</td>
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<tr>
<td>Research with human participants: ethics and integrity*</td>
<td>Creation of consent form</td>
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<tr>
<td>Research with human participants: Case studies*</td>
<td>Institutional AAALAC accreditation</td>
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<tr>
<td>Research with animals: Basic responsibilities*</td>
<td>Understanding pain, stress and distress in animal research</td>
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<td>Research with animals: Your context*</td>
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<td>Managing and protecting interests: An introduction</td>
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<td>Conflict of interest</td>
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<td>Workplace and environmental safety</td>
<td>Workplace and environmental safety risks and checklist</td>
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<td>Institutional AAALAC accreditation</td>
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<td>Institutional AAALAC accreditation</td>
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<td>Conducting research</td>
<td>Reflection on research record keeping</td>
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<tr>
<td>Research record</td>
<td>Reflection on research record keeping</td>
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<td>Guidelines and policies: data sharing, data security, data storage</td>
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<td>Reflection on personal research environment</td>
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<td>Module summary</td>
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## MODULE 4: REPORTING

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<td>Scholarly publishing</td>
<td>Publication practices and challenges in your field</td>
<td>[RP] (30)</td>
</tr>
<tr>
<td>Case studies and advice: Pressure to publish</td>
<td>Avoiding plagiarism</td>
<td>[CTL] (45)</td>
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<tr>
<td>Plagiarism</td>
<td>Reflection on experiences with authorship</td>
<td>[RP] (30)</td>
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<tr>
<td>Authorship</td>
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<td>[RP] (15)</td>
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<td>Peer review</td>
<td>Reflection on video</td>
<td>[RP] (15)</td>
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### Module summary

### MODULE 5: RESPONSIBILITIES TO SOCIETY

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<th>Reflection on own department’s funding and engagement</th>
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<tr>
<td>Advocacy</td>
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</tr>
<tr>
<td>Case studies and advice: Advocacy</td>
<td>Identifying social responsibility in research issues in the news</td>
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</tr>
<tr>
<td>Responsibility to society</td>
<td>Social responsibility: Case studies</td>
<td>[CTL] (90)</td>
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### Module summary

### CLOSING

<table>
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<tr>
<th>Course summary</th>
<th>Key learning points</th>
<th>[RP] (15)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Inaugural integrity meeting</td>
<td>(60)</td>
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</tbody>
</table>
Communicative activities

The following pages contain the communicative activities, designed to accompany and extend on material worked through in the self-study course. There are two types of communicative activity:

- Peer-to-peer activities (CP2P), which encourage participants to interact with one another and share experiences, either through VLE-hosted discussion boards or in face-to-face discussions
- Tutor-led activities (CTL), which are designed to be led by a tutor, and include topics for workshop discussions and assignments.

These activities can be incorporated by universities throughout the RI programme according to their requirements. They can be used either online (for example, via discussion boards and webinars) or face-to-face. Instructions on how to add them to the online course are included in Section 2.
MODULE 1: INTRODUCTION

A code of conduct for... (CTL)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, tutor-led</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Principles and responsibilities</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will improve your understanding of the purpose and essential elements of a code of conduct for research in the field(s) of study covered in the course and how they apply in your particular field.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>Set aside time in a group of any size to discuss and adapt the outline in the Singapore Statement to the discipline(s) included in the course.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>15-30 minutes, depending on the level of detail</td>
</tr>
<tr>
<td>Activity resources</td>
<td>The primary reading for this activity is the Singapore Statement (<a href="http://www.singaporestatement.org">www.singaporestatement.org</a>).</td>
</tr>
</tbody>
</table>

Instructions for tutor

An opportune time to raise professional standards for research is when discussing some topic or issue on which there is some disagreement – the cause of a particular historical event or natural phenomenon, how facts should be interpreted, and the like.

Ask participants to consider the following questions:

- When researchers disagree, how do they discuss and resolve their differences?
- What are the professional rules for responsible professional behaviour?

Using the Singapore statement as a framework for professional behaviour, ask participants to think about the professional rules for research in their field(s) and come to the teaching session prepared to share their thoughts with their peers/colleagues. Everyone should be prepared to expand on several of the responsibilities outlined in the Singapore Statement.

The outcome of this activity should be a code of conduct for one or more fields of research covered in the course.

At the end of the exercise, suggest that this code also applies to any work which participants do in the course and particularly to any course research papers they write.

Instructions for participant

Scholars don’t always agree about the ‘content’ taught in, for example, a course on a particular subject. They can have different views on the cause of a particular historical event or natural phenomenon, how facts should be interpreted, and the like.

Consider the following questions:

- When scholars disagree, how do they discuss and resolve their differences?
- What are the professional rules for responsible professional behaviour?

Using the Singapore Statement as a framework for professional behaviour, think about the professional rules for research in the field(s) discussed in this course and come to this session prepared to share your thoughts with your peers/colleagues. You will be asked to expand on several of the responsibilities outlined in the Singapore Statement as they apply to what you are studying and how researchers/scholars reach conclusions.
During the next group discussion, your goal is to work with your peers/colleagues to develop a code of conduct for one or more fields of research covered in the course.

Don’t forget that the code you develop will apply to your work in the group and particularly to any research papers you write.
Justifications and motivations for research behaviour (CP2P)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, peer-to-peer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Flexible / Welcome</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will provide you with a deeper understanding of the motivations and justifications for research behaviour and highlight that there are differences of opinion about responsible conduct in research.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This activity is best implemented through an online discussion board or chat room.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>60 minutes in total, spread across several weeks. Participants should be expected to enter an initial post and respond to two or three of their peers’ posts.</td>
</tr>
</tbody>
</table>

Instructions for tutor

This activity can be used in conjunction with any of the polls in the course, or with research integrity issues raised in other courses. The description that follows uses the first poll on the opening screen of this module (‘Welcome’) – about whether to list a retracted article on your résumé – as an example.

The goals of this activity are to get participants to:

- Explain their choice on the poll
- Understand and respond to other opinions.

Hence, this activity is most effective in cases where there are clearly differing views.

The activity should be clearly introduced so there are no doubts about what should be discussed. For the poll in question, the following text could be used:

When confronting difficult integrity decisions (such as deciding whether to list an article you helped to write on your résumé if it has been retracted because a co-author plagiarised some text) it is important to understand and evaluate your motivations. This exercise provides you with an opportunity to explain your thoughts about proper behaviour and to compare them with what others have to say. Briefly (one or two short paragraphs) explain the decision you made in the poll. Then, over the next few weeks, revisit this activity, read what others have to say, and respond to one or two of your peers’ posts.

If this is the only time you are using this activity in your teaching, make sure you set out a few simple rules for public discussions such as:

- Don’t reveal any information that is not appropriate for public discussion, such as details about the behaviour of fellow participants or colleagues
- Be respectful when you disagree – don’t accuse others of being ‘dumb’, ‘biased’, or other such words
- Be brief and focus on main points – longer comments are generally not taken seriously or read carefully

Someone needs to monitor this discussion. Despite warning, participants may enter inappropriate material. Decide how you will handle inappropriate entries and let the group know in advance. If you intend to delete offending entries, make sure you let the group know this in advance and give some ground rules for judging offensive entries.

Finally, make sure you allow some time for drawing this discussion to a close. This could be done by:
Closing the online discussion and adding one summary statement of your own
Setting some time in a teaching session to discuss
Including the summarising task as an exam question. For example, you could:
  o Write an essay question: ‘Discuss some of the reasons given by fellow members of the group for listing and not listing a retracted article on your résumé’
  o Include a multiple-choice question that lists reasons raised in the discussion and one or two that were not.

Instructions for participant

This activity provides you with an opportunity to share and discuss some of your thoughts about research integrity with others.

When confronting difficult integrity decisions (such as deciding whether to list an article you helped to write on your résumé if it has been retracted because a co-author plagiarised some text, as in the first poll question on the opening screen of this chapter, ‘Welcome’) it is important to understand and evaluate your motivations. This exercise provides you with an opportunity to explain your thoughts about proper behaviour and to compare them with what others have to say.

Your task
Briefly (one or two short paragraphs) explain why you made the decision you did in the poll on the first screen (‘Welcome’). Then, over the next few weeks, revisit this activity, read what others have to say, and respond to one or two of your peers’ posts.

As you explain and respond, please follow a few simple rules for public discussions:

  √ Don’t reveal any information that is not appropriate for public discussion, such as details about the behaviour of fellow participants or colleagues
  √ Be respectful when you disagree – don’t accuse others of being ‘dumb’, ‘biased’, or other such words
  √ Be brief and focus on main points – longer comments are generally not taken seriously or read carefully.

At the end of the discussion period, we will set aside time to see what conclusions can be drawn and/or I will wrap up a discussion with a few lessons that can be drawn from your discussion and/or you will have a chance to reflect on the discussion in an upcoming exam.
MODULE 2: PLANNING

What makes research ethical? (CP2P)*

<table>
<thead>
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<th>Activity type</th>
<th>Communicative, peer-to-peer</th>
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<tbody>
<tr>
<td>Corresponding screen</td>
<td>Research with human participants: Key principles*</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will give you a better grasp of the elements of ethical research with human participants and will encourage you to apply what you have learned to your own research.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This activity can be implemented using an online discussion board or through a face-to-face discussion session.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>60-90 minutes</td>
</tr>
</tbody>
</table>

* Note: This screen does not appear in all track versions of the Research Integrity programme.

Instructions for participant

In their article, ‘What makes clinical research ethical?’ Emanuel et al 4 describe seven requirements of ethical research. Read the abstract of their article, which is available online at www.ncbi.nlm.nih.gov/pubmed/10819955, and pay particular attention to the seven ‘requirements that systematically elucidate a coherent framework for evaluating the ethics of clinical research studies’.

Think about a research project that you are involved in currently or one you have worked on in the past and describe how each of these seven requirements was (or was not) met.

1. Describe how these requirements were ‘adapted to the health, economic, cultural, and technological conditions in which clinical research is conducted’, if appropriate.
2. Discuss your reflections with your colleagues. Take the time to review and comment on your peers’ lists.

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The ethics of REC review (CP2P)*

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<thead>
<tr>
<th>Activity type</th>
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</thead>
<tbody>
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<td>Corresponding screen</td>
<td>Research with human participants: Getting approval*</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will improve your understanding of how Research Ethics Committees work and what responsibilities they have to the participants of research.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This activity will work best using a discussion board. Each participant should have their own thread in order to post their answers. Tutors may also choose to use this activity as the basis for a face-to-face group discussion.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>90 minutes</td>
</tr>
<tr>
<td>Activity resources</td>
<td>‘Should society allow Research Ethics Boards to be run as for-profit enterprises?’, available online at <a href="http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0030309">http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0030309</a>.</td>
</tr>
</tbody>
</table>

* Note: This screen does not appear in all track versions of the Research Integrity programme.

Instructions for tutor

This activity will encourage researchers to think more deeply about their responsibilities to research participants above and beyond the requirements of the Research Ethics Committee. The activity is designed as a peer-to-peer exercise, but you can use the postings on the discussion board as the basis of a discussion group. If your discussion group is large, it is better to begin with small groups of researchers discussing the questions and then invite these small groups to report back to the whole group.

Instructions for participant

Read the short written debate, ‘Should society allow Research Ethics Boards to be run as for-profit enterprises?’ (available online at http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0030309) and prepare short answers to the following questions:

- What are the advantages and disadvantages of for-profit Research Ethics Committees?
- Do you think for-profit Research Ethics Committees should be allowed? Explain your position.
- What is the difference between getting approval from a Research Ethics Committee and your responsibility to your research participants? That is, does your responsibility to research participants end with getting ethics approval?

Post your responses to these questions on the discussion board. How do your responses compare to those of others? Take the time to read and comment on your peers’ responses.
Understanding pain, stress and distress in animal research (CTL)*

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, tutor-led</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Research with animals: Your context*</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will contribute towards your ability to understand how pain, stress, and distress are defined, assessed, and managed in research with animals.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This activity is best rendered by organising participants into small groups and setting up an online discussion thread for each group. Each group should be led by a veterinarian or a senior researcher with extensive experience in research with animals. If possible, each group should focus on a different class of research animals.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>60-90 minutes</td>
</tr>
</tbody>
</table>

* Note: This screen does not appear in all track versions of the Research Integrity programme.

**Instructions for tutor**

Participants should read the relevant material on ‘Pain and distress’, in preparation for a group discussion on this issue.

Encourage participants to develop their understanding of pain, stress, and distress in the type of laboratory animal under consideration. Help participants within each group to reach a consensus on how the literature applies to their own research with animals.

**Instructions for participant**


Take some time to explore the literature independently. Try to consolidate your understanding of how stress and distress may be manifested in the type of research animal you have been asked to consider.

Use the online discussion thread to share your thoughts with your peers. Can you reach a consensus on this topic?

---

Thinking about conflicts of interest (CTL)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, tutor-led</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screens</td>
<td>Managing and protecting interests: An introduction OR Research with human participants: Ethics and integrity</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will give you a deeper appreciation of how conflicts of interest can harm research participants and will see the difficulties associated with ‘remedies’ for those conflicts.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This activity can be implemented through an online discussion board or in a discussion group.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>90 minutes</td>
</tr>
<tr>
<td>Activity resources</td>
<td>'Why disclosure?', available online at <a href="http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1831613/">http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1831613/</a></td>
</tr>
</tbody>
</table>

Instructions for tutor

This activity will encourage researchers to think more deeply about conflicts of interest and the difficulty of managing those conflicts. Participants will read a short article on this topic and will prepare short written answers to the questions posed. This can be done before the session or during the session, as desired. Once participants have prepared their answers, invite them to discuss their ideas in groups of three or four for 10 to 15 minutes. Finally, bring the larger group together and ask each small group to summarise their discussion.

Instructions for participant

Read the short article, ‘Why disclosure?’ (found at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1831613/) and prepare short answers to the following questions:

- What dangers do conflicts of interest pose?
- What has the scientific community done in order to eliminate or minimise these dangers?
- How effective are the existing strategies for reducing the harm of conflicts of interest?
- What approaches for managing conflicts of interest would you propose?

Your tutor will ask you to discuss your answers with two or three of your peers and will then invite each group to share what they have learned with the larger group.
Assessing conflicting financial interests (CTL)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, tutor-led</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Financial interests and intellectual property</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will contribute towards your ability to understand the possible influences of conflicting interests, both from your own perspective and from the perspective of others.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This activity is best rendered by setting up an online discussion board for the group. The activity could also be carried out in an in-person discussion session.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>60-90 minutes</td>
</tr>
</tbody>
</table>

Instructions for tutor

Look at the referenced ‘Financial conflicts of interest checklist’ (2010) for clinical research studies and consider how each of the four sections might be adapted to apply to researchers in their specific science and engineering disciplines. While the checklist is designed to highlight the pressures faced by biomedical researchers designing, conducting, and reporting on human clinical research, it has broader relevance to researchers in other disciplines thanks to its focus on:

- Administrative information
- Study information
- Personal financial information
- Authorship information.

You might choose to focus on a real research collaboration or a hypothetical research collaboration as the basis for leading a group discussion about how the personal interests of those involved might lead to conflicting interests or bias the study’s outcomes.

Explain to participants that they are going to consider the collaboration from a number of different perspectives. Assign the following roles to participants (individually or in small groups, depending on the size of the discussion group):

- Postdoctoral researchers
- Technical staff
- Statistical consultants
- Funding bodies
- Members of the public.

You may wish to add other contributors to this list.

Invite participants to complete the checklist from the perspective of their assumed role. You should adopt the role of research supervisor or principal investigator yourself, and facilitate the discussion about conflicting interests from this perspective.

Instructions for participant

In this activity, you will take on the role of someone who might routinely contribute to collaborations in your research disciplines. Your task is to consider the checklist for conflicts of interest from the perspective of the
contributor assigned to you. Once you have completed this, compare your individual perspectives and interests to those of your peers.

- How similar are your interests to those of the other contributors? In what ways do they differ?
- How might your interests and those of the other contributors bias the outcomes of the research?
MODULE 3: CONDUCTING

Record keeping, data management, and sharing of information (CP2P)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, peer-to-peer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Research data</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will contribute towards your ability to ensure the integrity of primary data and to share it appropriately, and to understand the constraints on requesting resources to be shared with you.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This activity is best carried out by organising participants into small groups (three to six) and setting up an online discussion thread for each group.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>60-90 minutes</td>
</tr>
<tr>
<td>Activity resources</td>
<td><a href="http://ori.hhs.gov/data-management-0">http://ori.hhs.gov/data-management-0</a></td>
</tr>
</tbody>
</table>

Instructions for tutor

In this activity, participants are asked to talk to a more experienced colleague, in preparation for a group discussion about lessons learned and differences in individual experiences.

Be prepared to offer specific situations or cases that might stimulate and guide discussions (see the referenced website for examples).

If time allows, this approach could be used over several discussion sessions, with a different situation or case study being addressed on each occasion.

Instructions for participant

How would you define ‘data’ in the context of your own research?

Identify a more experienced researcher in your department or programme, and ask him or her to serve as your research integrity consultant for this exercise.

Ask your research integrity consultant the following questions:

- When is it appropriate/acceptable to share information?
- When might sharing information be unwise?
- If it is appropriate to share information, what is the best way of doing this?
- How do you review and verify the clarity/accuracy of the data collected by the researchers and trainees you supervise?

Use the online discussion thread to present your findings to your peers. How do their findings compare to your own? What lessons can you learn from this?
Collaborating across disciplines (CTL)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, tutor-led</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Collaboration and the research environment</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will contribute towards participants’ ability to reflect on the implications of disciplinary differences in conducting research.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>Bring together the participants (from different disciplines if possible) to react to the reading below and share their thoughts on how interdisciplinarity contributes to research activities.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>60 minutes</td>
</tr>
<tr>
<td>Activity resources</td>
<td>Participants are asked to read an excerpt from Facilitating interdisciplinary research, published by the National Academies Press (2004), available online at <a href="http://www.nap.edu/catalog.php?record_id=11153">www.nap.edu/catalog.php?record_id=11153</a>.</td>
</tr>
</tbody>
</table>

**Instructions for tutor**

In this activity participants are asked to read the excerpt which summarises a vision of interdisciplinary research. Participants are asked to consider a number of questions and to reflect on how disciplinary differences might affect research or how bringing a researcher from another discipline into their team might help to further their research findings/goals.

**Instructions for participant**

Read the excerpt on the next page. Reflect on your research project and answer the following questions:

- Is your research team interdisciplinary, or are all of the members of the team from the same discipline?
- If your team is interdisciplinary, identify the disciplines and consider the research expertise and processes that these members bring to the project.
  - How does their presence on the team affect the activities of the team and your considerations for responsible conduct?
  - What can you do to increase your understanding of the procedures and responsibilities inherent in this complementary research area?
- If your team is not interdisciplinary, consider the project you are working on.
  - What disciplines might you consider complementary to your research question or topic?
  - How could your research project potentially benefit from an interdisciplinary approach?
  - What would you need to do to increase your understanding of this complementary field?
“Interdisciplinary research (IDR) can be one of the most productive and inspiring of human pursuits – one that provides a format for conversations and connections that lead to new knowledge. As a mode of discovery and education, it has delivered much already and promises more – a sustainable environment, healthier and more prosperous lives, new discoveries and technologies to inspire young minds, and a deeper understanding of our place in space and time.

We are not students of some subject matter, but students of problems. And problems may cut right across the borders of any subject matter or discipline.

Karl Popper

Interdisciplinary research and education are inspired by the drive to solve complex questions and problems, whether generated by scientific curiosity or by society, and lead researchers in different disciplines to meet at the interfaces and frontiers of those disciplines and even to cross frontiers to form new disciplines.

In recent decades, the growth of scientific and technical knowledge has prompted scientists, engineers, social scientists, and humanists to join in addressing complex problems that must be attacked simultaneously with deep knowledge from different perspectives. Students show increasing enthusiasm about problems of global importance that have practical consequences, such as disease prevention, economic development, social inequality, and global climate change – all of which can best be addressed through IDR. A glance across the research landscape reveals how many of today’s ‘hot topics’ are interdisciplinary: nanotechnology, genomics and proteomics, bioinformatics, neuroscience, conflict, and terrorism. All those invite and even demand interdisciplinary participation. Similarly, many of the great research triumphs are products of interdisciplinary inquiry and collaboration: discovery of the structure of DNA, magnetic resonance imaging, the Manhattan Project, laser eye surgery, radar, human genome sequencing, the “green revolution,” and manned space flight. There can be no question about the productivity and effectiveness of research teams formed of partners with diverse expertise.

On an individual basis, studies show that situational factors, such as exposure to ideas outside one’s own discipline, may have a positive impact on researchers in their own discipline. Prolific and influential researchers are more likely to keep up with developments outside their own domains, and this interdisciplinary curiosity can lead to major breakthroughs on their own projects. For example, it was Charles Darwin’s reading of Malthus’s ‘An essay on the principle of population’ that led to his theory of natural selection.”
The research meeting (CP2P)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, peer-to-peer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Module summary</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will encourage active rather than passive participation in research integrity.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This can be an in-person discussion, or a virtual discussion in an online discussion environment.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>60 minutes (20-30 minutes to reflect, plus discussion time)</td>
</tr>
</tbody>
</table>

**Instructions for tutor**

Participants explore the structure and content of their current research meeting and share their impressions on which aspects reflect good research practice, which aspects could be improved and what potential actions they could take to improve the situation if needed.

Participants should spend 20-30 minutes writing a reflection on their most recent research meeting with their research colleagues and/or mentor. Participants should reflect on the following:

- Meeting location and attendees
- Structure of meeting
- Goal of the meeting
- General topics addressed
- Length of meeting
- Opportunities for participation
- Effectiveness of the meeting
- The feeling in the room/space.

After sharing their reflections with the group, participants should assist each other in answering the following questions:

- What aspects of the meeting reflect responsible research practice?
- Were there any aspects of the meeting that reflected poor research practice?
- If there were poor practices, what could be done to improve the practices?
- How might the participant assist in making these improvements?

If this is done online, the participant can post their own reflections on a discussion board and then comment on the reflections shared by their peers.

The goal is to identify things that the participant can do to improve the research meeting structure and effectiveness in the context of responsible conduct of research.

**Instructions for participant**

Spend 20-30 minutes writing a reflection on your most recent research meeting with your research colleagues and/or mentor. You should reflect on the following:

- Meeting location and attendees
- Structure of meeting
- Goal of the meeting
- General topics addressed
- Length of meeting
- Opportunities for participation
- Effectiveness of the meeting
The feeling in the room/space.

You will be asked to your reflections with the group. You will then have the opportunity to collaborate with your peers to answer the following questions:

- What aspects of the meeting reflect responsible research practice?
- Were there any aspects of the meeting that reflected poor research practice?
- If there were poor practices, what could be done to improve the practices?
- How could you assist in making these improvements?

If an online discussion board or chat room is available, post your reflections and then comment on the reflections shared by your peers.

Can you identify any actions you could take to improve the structure and effectiveness of the research meeting in the context of responsible conduct of research?
MODULE 4: REPORTING

Publication standards and peer review (CTL)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, tutor-led</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Scholarly publishing OR Peer review</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will contribute to your understanding of how a reviewer might evaluate their work for potential publication.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This activity asks participants to evaluate their own recent work in light of a journal’s publication standards, using a peer-review format.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>30 minutes</td>
</tr>
</tbody>
</table>

**Instructions for tutor**

Most early-career researchers need specific training in reviewing others’ work. This exercise will help participants understand how to write reviews.

**Before the discussion session**

Request permission from the relevant journal to use a manuscript that you have reviewed, as well as your own review (both stripped of information that would identify the authors). Provide participants with access to the manuscript to read before the session. Also provide the journal’s publication standards and review criteria.

Ask the participants to write a review of the manuscript, based on the publication standards and the review criteria.

**In the session**

Discuss publication standards and peer review. Then ask the participants to form groups of three and to read each others’ reviews. Ask them to focus on the reviews with reference to the standards and criteria, rather than discussing the article at length.

**In plenary session**

Ask for comments on the reviews, with a focus on the characteristics of the best reviews. Finally, distribute your own review of the manuscript for further plenary discussion.

**Instructions for participant**

In this activity you will be asked to read a manuscript and imagine that you are a peer reviewer for the relevant journal. Write a review of the paper, applying the journal’s publication standards. Explain to the author what specifically would need to be changed for the paper to be accepted for publication in that journal.

Remember that your review should be:

- Clear
- Respectful
- Constructive.

Submit your review to your peers. Provide careful and constructive feedback to the peers who send you their materials. Review the feedback that others give you.
Avoiding plagiarism (CTL)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, tutor-led</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Plagiarism</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will show you how to use published literature in your own writing without plagiarising.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This activity can be implemented through an online discussion board or in a discussion group. Participants may work in pairs or in groups.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>45 minutes</td>
</tr>
</tbody>
</table>

Instructions for tutor

Tutors generally assume that researchers know how to use and cite material from the literature in their writing without committing plagiarism. Many, however, are uncertain about the nuances of proper citation format or the construction of an appropriate paraphrase. This exercise gives participants an opportunity to practice referencing published material, as well as showing them alternative approaches taken by their peers.

Before the discussion session
Select and provide access to a research article. Ask participants to read the article before they arrive for the discussion session.

In the session
Discuss plagiarism, using examples or well-known cases. Then ask the participants to write a few sentences that capture the main point of the article:

1. Using a direct quotation from the article
2. Using a paraphrase of a particular section
3. Referring to the article to support a point, without direct quotation or paraphrase.

Remind participants to use proper citation form, according to the standards of their field.

When the participants are finished, ask them to form groups (ideally of two to three) to compare and discuss what they have written. Ask them to choose the best of their responses to 1-3 above. The three best responses may, of course, come from different people in the group.

Ask each group to submit their best responses to you, electronically if possible. Display and discuss some of the submitted responses in plenary session, pointing out strengths and suggesting improvements.

Note: If participants are involved in substantially different areas of research, consider providing a set of articles from which they can choose. When they form discussion groups in session, ensure that members of each group have worked on the same article. In plenary session, display the original passage under discussion along with the paraphrase.
Instructions for participant

Are you sometimes uncertain what you have to do to avoid plagiarism in your own writing? This activity will clarify some of the rules.

Your tutor will provide you with an article to read before the discussion session.

For each of the following options, write a few sentences that capture the main point of the passage as you would in an article:

1. Using a direct quotation from the passage
2. Using a paraphrase of a particular section
3. Referring to the passage to support a point, without direct quotation or paraphrase.

In each case, use proper citation form, according to the standards of your field.

Submit the original passage and your three pieces of writing to your peers. Provide careful and constructive feedback to the peers who send you their materials. Review the feedback that others give you.
Making authorship decisions (CP2P)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, peer-to-peer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Authorship</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will improve your understanding of how the principles of authorship apply to your own research.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This activity can be implemented through an online discussion board or in a discussion group. Participants may work in pairs or small groups.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>45 minutes</td>
</tr>
</tbody>
</table>

Instructions for tutor

Researchers are often unaware of differences in various journals’ authorship policies. They may not have given careful consideration to the criteria that determine who appears on an author list and in what order.

Before the discussion session
Ask participants to look up the authorship policies of a journal in their field.

In the session

Discuss authorship requirements. Ask participants to consider an article that would be based on the research they are currently doing. Based on the authorship policies they have found, ask them to write answers to the following:

1. Who would be listed as an author?
2. In what order would the authors be listed?
3. What rationale supports the inclusion of each author? The order of authors?

When the participants have finished, ask for a few volunteers to share their answers with the whole group, either orally or by displaying the responses electronically. Discuss the volunteers' responses, one at a time, mentioning all relevant considerations.

Instructions for participant

How will you make decisions about authorship on the papers you will be writing?

Look up the authorship policy of the journal in which you most want to be published. Then answer the following questions:

1. What are the journal's criteria for authorship?
2. If your next research paper were to be published there, who would be listed as an author? In what order?
3. Provide a rationale for including each author listed in (2), according to the criteria in (1).

Submit the authorship policy and your response to your peers. Provide careful and constructive feedback to the peers who send you their materials. Review the feedback that others give you.
MODULE 5: RESPONSIBILITIES TO SOCIETY

Identifying social responsibility in research issues in the news (CP2P)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, peer-to-peer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Responsibility to society</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will contribute to your ability to identify and understand social responsibility issues in research as reported in the media.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>Participants can share their findings via an online discussion board or in a face-to-face discussion group.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>90 minutes – 2 hours</td>
</tr>
<tr>
<td>Activity resources</td>
<td>A good web clipping programme is Evernote, which is available as freeware: <a href="http://www.evernote.com/">http://www.evernote.com/</a></td>
</tr>
</tbody>
</table>

Instructions for tutor

In this activity, participants are asked to find news stories which focus on researchers’ responsibilities to society.

Participants should classify the stories according to whether they involve advocacy or potential for dual use, and any other issues that may have implications for the public.

Once classified and organised, these will form a short journal of relevant news stories. Participants should then write a short summary (two or three paragraphs) of the kinds of issues which are involved in taking responsibility for outcomes and dissemination of research.

Instructions for participant

Browse the web for news stories which focus on researchers’ responsibilities to society. Around three stories should be sufficient, but the stories should be on different topics, depending on your discipline. Selected stories should be clipped and saved. They can be printed out or saved using a web clipping programme.

Share your clippings with your peers in your group. If you are working on your own, then you may want to spend extra time finding a few more stories so that in total you have about eight or nine stories.

Classify the stories according to whether they involve advocacy or potential for dual use, and any other issues that may have implications for the public.

Once classified and organised, collect together all the stories to make a short journal of relevant news stories. This can be an electronic copy or a hard copy.

Write a brief summary (two or three paragraphs) outlining the kinds of issues which are involved in taking responsibility for outcomes and dissemination of research. This should work around the classification and organisation of the clippings and include a brief introduction and conclusion. Share your summary with your peers and provide feedback on others’ summaries.
Social responsibility: Case studies (CTL)

<table>
<thead>
<tr>
<th>Activity type</th>
<th>Communicative, tutor-led</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding screen</td>
<td>Responsibility to society</td>
</tr>
<tr>
<td>Learning objective</td>
<td>Completing this activity will contribute to your understanding of the main issues in social responsibility as presented in the media.</td>
</tr>
<tr>
<td>Implementation description</td>
<td>This activity is best implemented through an online discussion board with a separate thread for each case study.</td>
</tr>
<tr>
<td>Suggested study time</td>
<td>90 minutes – 2 hours</td>
</tr>
</tbody>
</table>

Instructions for tutor

This activity builds on the project of compiling a journal of clippings by asking participants to design case studies to help their peers to learn about the main issues illustrated in the news.

After participants have compiled a clippings journal using around eight or nine stories, individually or as a group, instruct the participants to each choose one story from their journal.

They should then identify, based on their classification and summary, what the main issue is for their story.

Participants should then design a case study based on this story which showcases the issue they have identified.

Case studies should be aimed at researchers who have not participated in integrity training and should help them to gain some grasp of the main issues in social responsibility.

Instructions for participant

Select one news story from your journal. Identify what the main issue is for that story, using your classification and summary to help you.

Your task
You should then design a case study based on this story which showcases the issue you have identified.

Case studies should be aimed at researchers who have not participated in training and should help them to gain some grasp of the main issues in social responsibility.
Assessment materials

For each module of the RI programme, we provide multiple-choice questions and essay questions/case studies.

Multiple choice questions
The RI programme is delivered with an accompanying testbank of questions and we encourage institutions to implement this (following the instructions in Section 2). In addition, within this Supplement, we provide a short set of further questions which, depending on your particular preference, can be:

- Added to the existing testbank to create a larger set of questions
- Added at the end of each module as a check on understanding before participants are allowed to continue to the next module. Your ability to do this will depend on the particular VLE you are using.

Generally, there are two options:
- IMS Content Package: If your system allows you to reorganise the course navigation of IMS Content Packages, you will be able to place quiz units into the course. You can construct quiz units from the test banks available for download and use the VLE quiz settings to only release further modules once a user has passed a quiz at the end of the previous one.
- Common Cartridge v1.0: If your system accepts the IMS Common Cartridge format, you will be able to insert quiz units between modules. These quiz units can then be formatted to only release further modules once a user has passed a quiz at the end of the previous one. To find out if your system accepts IMS Common Cartridge, and for help with adding the quiz units, please contact us.

To find out whether you VLE falls into either of the two categories above and for help with adding the quiz units, please contact us.

Essay questions and case studies
The essay questions and case studies contained within this section can be:

- Used as the basis for group activities and discussions to further broaden and deepen participants’ learning.
- Used alongside the multiple-choice quizzes and Research Integrity portfolio to form a rich suite of assessments options

Note that the regularly-updated ‘Research integrity in the news’ pod can also provide a useful source of case study and discussion material. Access it from the right-hand box on the screen ‘Principles vs. practice’ in Module 1 or at www.epigeum.com/downloads/ri/pages/ri_in_the_news.html.

Many of the multiple-choice questions and essay questions/case studies in this section are suitable for all five of the Research Integrity subject tracks; others are more suited to a particular subject area. In the table that follows, this is indicated in the far right-hand column.
## Module 1: Introduction

### Multiple-Choice Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Possible answers</th>
<th>Feedback</th>
<th>Subject tracks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of the following statements is NOT an accurate characterisation of what is known about research behaviour?</td>
<td>Serious misconduct is rare and generally quickly discovered by the research community</td>
<td>None of these statements is true. Definitions of misconduct and questionable research practices may vary in different institutions or different countries, but studies have shown that they are more common than many researchers realise. Responsible researchers must not underestimate the importance of learning to act with integrity.</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Although rare, the overall impact of serious misconduct in research is much greater than the overall impact of questionable research behaviours</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>There is widespread professional agreement on practices that should be classed as questionable research practices</td>
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<td></td>
<td>On the whole, if you are naturally honest then you need not worry about any of this</td>
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<tr>
<td></td>
<td>None of the previous statements are accurate [CORRECT ANSWER]</td>
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</tr>
<tr>
<td>Which of the following is good advice for researchers who want to know more about their professional responsibilities?</td>
<td>Know and put into practice the rules and guidelines that are applicable to your research [CORRECT ANSWER]</td>
<td>Advice from colleagues can be helpful and basic principles like honesty are very important. But the bottom line is that researchers have a responsibility to be informed about any policies or regulations that apply to their work.</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Pay particular attention to the unwritten but commonly accepted practices used in your area of research</td>
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<td></td>
<td>Assume that a broad commitment to best practice and honesty will guide you through difficult decisions</td>
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<td></td>
<td>Avoid asking advice from others, as they may lead you astray</td>
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<tr>
<td></td>
<td>All of the previous statements are accurate [CORRECT ANSWER]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Which of the following is an appropriate response to suspected research misconduct?</td>
<td>Discuss with the person you suspect of misconduct to avoid any misunderstandings</td>
<td>This is a difficult situation and the correct course of action may not be clear. However, the best response is usually to present your evidence to the appropriate authority within your institution (e.g. the Research Integrity Officer). The other options all entail risks and may compromise later inquiries or investigations.</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Discuss with colleagues to see if they agree that misconduct might have been committed</td>
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<td></td>
<td>Report to the suspect’s immediate superior to respect normal lines of communication</td>
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<td></td>
<td>Go to the press</td>
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<tr>
<td></td>
<td>None of the above is accurate [CORRECT ANSWER]</td>
<td></td>
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</tbody>
</table>

### Additional Essay/Case Study Suggestions

**Integrity log**

- **Purpose:** To make you more aware of the many decisions researchers have to make and to get you thinking about how you make decisions.
- **Duration:** Record-keeping time (days/weeks) + 30 minutes

**Task: Part 1**

Over the course of a few days or a few weeks (depending on how much time you spend doing research), keep a record of all of the ‘should/should-not’ decisions you make and your rationale for each one, and in particular the
outside reference point/authority it refers to. (For example, if a colleague asked you for information about your research and you were not sure whether to share that information, how did you ultimately decide? Did you ask someone else? A mentor? Was your decision based on a policy or guideline?)

**Task: Part 2**
Once you have collected enough examples, discuss your decisions and experience with a colleague, mentor or friend. As you do so, consider the following questions:

- Would they have made the same decisions?
- How do researchers make decisions about right and wrong behaviour?
- How should they make decisions about right and wrong behaviour?

Write up your findings.

### Research misconduct in your discipline

| Purpose: To learn more about research integrity in your field of study |
| Duration: 60 minutes |

**Task**
Open your favourite search engine and enter three words: ‘research’, ‘misconduct’ and your field of study. Run the search and see what you find.

As you can probably predict, if your field of study is one that has experienced quite a number of cases of misconduct, many of them will appear in your search. If you are in a field where there have not been a large number of cases, then your search results may be very different. For example, a search under ‘humanities’ is likely to turn up the ‘National Endowment for the Humanities’ misconduct policy but few (if any) cases. Be persistent:

- Try substituting ‘plagiarism’ for ‘research misconduct’
- Add ‘cases’ to your search terms and you will discover some cases (because most fields of research have experienced some plagiarism)
- You might also try ‘copyright infringement’ or similar words that better describe possible misbehaviour in your field of research.

Once you have completed a number of searches, write down your thoughts on research integrity in your field of study. In particular, consider the following questions:

- Have you found any problems that are more important – or more frequent – than others? If so, why?
- If you did not find much discussion of research integrity in your field of study, why not?

If you have a chance, discuss your findings with a colleague, mentor or friend, and add a summary of your conversation, together with any further thoughts, to your written piece summarising your findings.
## Module 2: Planning

### Multiple-Choice Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Possible answers</th>
<th>Feedback</th>
<th>Subject tracks</th>
</tr>
</thead>
</table>
| Which of these elements of planning is related to protecting the integrity of your research? | Developing your research question  
Literature review  
Method of analysis  
Plans for writing up your results  
All of the above [CORRECT ANSWER] | Each element must be thought through to avoid problems with integrity. Lack of planning can lead to cutting corners, the temptation to falsify results and harmful conflicts with colleagues. | All                               |
| An important part of the protection of human participants is the process of informed consent. Which statement about informed consent is true? | It must use technical language to describe research procedures  
It must be clear, concise and ongoing [CORRECT ANSWER]  
It must contain all possible information relevant to the research  
It must be done only once, at the beginning of the research  
All of the above | The point of informed consent is that the participant understands the research – this means avoiding technical language which can be hard to understand and not overwhelming participants with too much information. Consent is not a one-time thing: participants should be approached to confirm consent as the research continues. | All                               |
| Which of the following does NOT address job-related risks?               | Transferring, receiving and maintaining select agents  
Proper use of fume hoods  
Training requirements for animal users  
Conflict of interest disclosure requirements [CORRECT ANSWER]  
Monitoring activity of sealed radiation sources | While disclosing personal conflicts could be considered as protecting colleagues from the risk of harm, the potential harm is not to individual personal safety. Rather, conflicts of interest might pose problems for such things as the professional development of individuals or the integrity of research findings. | Biomedical Sciences  
Natural and Physical Sciences  
Engineering and Technology  
Social and Behavioural Sciences |
| Which of the following does NOT address job-related risks?               | Movement of heavy materials  
Research in potentially dangerous environments  
Training requirements for animal users  
Conflict of interest disclosure requirements [CORRECT ANSWER]  
Monitoring activity of sealed radiation sources | Whilst disclosing personal conflicts could be considered as protecting colleagues from the risk of harm, the potential harm is not to individual personal safety. Rather, conflicts of interest might pose problems for such things as the professional development of individuals or the integrity of research findings. | Social and Behavioural Sciences     |
| Which of the following is NOT an example of implementing the animal research guidelines known as the 3Rs? | Using pigs because their cardiovascular system compares with that in humans [CORRECT ANSWER]  
Using invertebrates instead of fish to study toxic effects  
Using more sensitive statistical analysis techniques  
Using analgesics or drugs to minimise pain or discomfort  
Housing wild animals in more spacious and natural settings | Using a specific research model must be scientifically and biologically justified, but it is not an example of replacement, reduction or refinement. | All except Arts and Humanities |
| Which of the following                                           | A study of archival documents about a historical figure | Oral history involves interviewing participants and will require | Arts and Humanities             |

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research projects is likely to involve obtaining consent from human participants?

<table>
<thead>
<tr>
<th>Collation of recordings from a publicly accessible media library</th>
<th>obtaining consent for the study from participants.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of performance space to study audience response</td>
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<tr>
<td>Oral history interviews [CORRECT ANSWER]</td>
<td></td>
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<tr>
<td>All of the answers given</td>
<td></td>
</tr>
</tbody>
</table>

**ADDITIONAL ESSAY/CASE STUDY SUGGESTIONS**

<table>
<thead>
<tr>
<th>Case study: Outsourcing of clinical trials</th>
<th>Purpose: Apply the principles of responsible research with human participants to a case study.</th>
<th>Duration: 45 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task: Part 1</td>
<td>Watch this video on the outsourcing of clinical trials: <a href="http://www.youtube.com/watch?v=g_p0kmrFi_o&amp;feature=sh_e_sl&amp;list=SL">www.youtube.com/watch?v=g_p0kmrFi_o&amp;feature=sh_e_sl&amp;list=SL</a>.</td>
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<tr>
<td>Task: Part 2</td>
<td>Create a piece of written work which:</td>
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<td></td>
<td>• Describes the violations of the principles and regulations that guide research with humans</td>
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<td>• Outlines the bases on which you evaluated the research and your rationale for this selection. (For example, did you use universal or local rules to judge what you saw, and why?).</td>
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</table>

<table>
<thead>
<tr>
<th>Activity: Planning human participant consent</th>
<th>Purpose: Develop project planning skills in relation to obtaining permission from human participants.</th>
<th>Duration: 60 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A historian is planning a complex project which will combine work done in archives with oral history accounts. The archival work will involve at least five or six sites, three of which are located in different countries abroad, and one of those three is in a very remote rural location. The interviews will mainly take place locally, but some of the interviewees are elderly and infirm. Some interviews will take place abroad.</td>
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<td>Design an outline that might be used in the planning stage which will show:</td>
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<td>• Permissions that are likely to be needed and consideration of the arrangements for obtaining access</td>
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<td></td>
<td>• A timeframe for obtaining permissions</td>
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<td></td>
<td>• A brief risk assessment which addresses safety concerns of any participants and the researcher</td>
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<td></td>
<td>• Significant issues that might be encountered for both archival and interview stages during planning.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Case study: Burnham et al (Version 1)</th>
<th>Purpose: Evaluate the possible causes of a lapse in research ethics using a recent case study.</th>
<th>Duration: 60 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background</td>
<td>Burnham et al (2006) estimated mortality in Iraq after the 2003 invasion by conducting a “national cross-sectional cluster sample survey” where each randomly selected cluster consisted of 40 households. In 2009, the lead author was sanctioned by his institution “for a lapse in ethics” (not protecting the confidentiality of interviewees). Full names (in Arabic which the author does not read) were included at the top of some of the data collection forms completed</td>
<td></td>
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</table>
during household interviews. The author did not complete the interviews but was held responsible.

**Task**

Using the information above and the references below, write a few paragraphs commenting on whether you consider this to have been an unforeseeable situation or the result of improper planning. Consider what could have been done with more detailed planning before the survey was initiated to ensure that confidentiality was protected under the difficult circumstances.

**References**


**Case study:** Burnham et al (Version 2)

- **Purpose:** Evaluate the possible causes of a lapse in research ethics using a recent case study.
- **Duration:** 60 minutes

Most of the shocking examples of mistreatment of human participants are found in areas of research where human participants are routinely used, such as clinical and sociological areas.

**Task**

Take a look at the following articles, to read about a case of confidentiality being breached following a house-to-house survey in Iraq:


- Using the information above, write a few paragraphs commenting on whether you consider this to have been an unforeseeable situation or the result of improper planning. Consider what could have been done with more detailed planning before the survey was initiated to ensure that confidentiality was protected under the difficult circumstances.

**Case study:** Jesse Gelsinger

- **Purpose:** Evaluate the possible causes of a lapse in research ethics using a recent case study.
- **Duration:** 60 minutes

**Background**

In 1999, Jesse Gelsinger, a healthy 18-year-old boy, died in a University of Pennsylvania gene therapy trial intended to cure an often-fatal genetic disorder that prevents the liver from metabolising ammonia. Both the University and the investigator had financial interests in a company that could have benefited from success in the gene therapy trial.

**Task: Part 1**

Use the links below to find out more about this case:

- [www.thehastingscenter.org/Bioethicsforum/Post.aspx?id=4034](http://www.thehastingscenter.org/Bioethicsforum/Post.aspx?id=4034)
- [www.highschoolbioethics.org/briefs/gelsinger.asp](http://www.highschoolbioethics.org/briefs/gelsinger.asp)

**Task: Part 2**
Now consider the following questions and write several paragraphs outlining your thoughts:

- What went wrong?
- What kinds of planning may have prevented Jesse’s death?
- How might a conflict of interest have contributed to this unfortunate result?
- Do you think that the informed consent process was handled properly?
## MODULE 3: CONDUCTING

### MULTIPLE-CHOICE QUESTIONS

<table>
<thead>
<tr>
<th>Question</th>
<th>Possible answers</th>
<th>Feedback</th>
<th>Subject tracks</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the most commonly reported form of QRP (questionable research practice) that occurs with respect to conducting research?</td>
<td>Inadequate record-keeping [CORRECT ANSWER]</td>
<td>Inadequate record-keeping to ensure the validity, originality and reconstruction of the research process is the most common questionable research practice.</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Omission of data in reporting</td>
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<td></td>
<td>Manipulation of research data</td>
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<td></td>
<td>Use of inappropriate analysis techniques</td>
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<td></td>
<td>Modification of methodologies due to pressure from funding source</td>
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<tr>
<td>If you find it necessary to exclude some of your data from your analysis, what is the best course of action?</td>
<td>Delete the data</td>
<td>It is essential that you can justify in an unbiased manner the exclusion of any data collected from the ensuing analysis. In addition, this exclusion should be reported in any publications of the project results.</td>
<td>All</td>
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<tr>
<td></td>
<td>Delete the data, but make a note in the research record</td>
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<tr>
<td></td>
<td>Retain the data, but don’t use them in the analysis</td>
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<tr>
<td></td>
<td>Retain the data, mark them as inappropriate, but keep them in the analysis</td>
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<td></td>
<td>Retain the data, mark them as inappropriate, note in the record why they were deemed inappropriate and don’t use them in the analysis [CORRECT ANSWER]</td>
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<tr>
<td>In a research collaboration, what should the researcher maintain as the focus of any problems that arise?</td>
<td>The reputation of the investigators</td>
<td>A research programme is built upon the integrity of the project as a whole. Put integrity before other needs and these needs will also be fulfilled.</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>The integrity of the research project [CORRECT ANSWER]</td>
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<td></td>
<td>The needs of the funding agency</td>
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<td></td>
<td>The reputation of the academic institution</td>
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<td></td>
<td>The feelings of the other team members</td>
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### ADDITIONAL ESSAY/CASE STUDY SUGGESTIONS

**Reflection exercise**

- **Duration:** 45 minutes
- **Purpose:** Reflect on potential threats to integrity during the course of conducting research.
- **Note:** This activity can be used either as an assignment/assessment activity or as a tutor-led face-to-face or online discussion.

**Part 1**
Ask participants to reflect on the following questions:

- What are your own goals and ambitions?
- If you are currently involved in a project, what are the external influences at play that may affect your behaviour?

**Part 2**
- Having reflected for a few minutes, ask participants to write their potential influences in block capitals on separate cards and collect them in.
- Group the participants in pairs then pass the cards out randomly between them. Ask each pair to discuss how the influences on the particular cards they have been given might affect decisions they might make in a research project.
- Finally, bring the group together to discuss what they can do to minimise these influences.

This activity can be adapted to become an individual activity by asking participants to write their list alone, then discuss it with a mentor or research supervisor.

<table>
<thead>
<tr>
<th>Case study: J. Hendrik Schön</th>
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<tbody>
<tr>
<td><strong>Duration:</strong> 30 minutes</td>
</tr>
<tr>
<td><strong>Purpose:</strong> Evaluate the possible causes of a lapse in research ethics using a recent case study.</td>
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</tbody>
</table>

**Task**
- Read about the case and write a summary of all the things that could have been done differently to avoid misconduct.

<table>
<thead>
<tr>
<th>Reflection exercise: Data protection, storage and interpretation</th>
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<tbody>
<tr>
<td><strong>Duration:</strong> 30 minutes</td>
</tr>
<tr>
<td><strong>Purpose:</strong> Consider potential complications relating to data protection, storage and interpretation.</td>
</tr>
</tbody>
</table>

**Background**
A historian is working on a complex project which combines work done in archives with oral history accounts. Some of the work is being done abroad and at remote locations.

**Task**
Assume that all permissions and plans for the work have gone according to the design that you proposed in the activity for Module 2. Now write a few paragraphs outlining your answers to the following questions:

- How should the recordings of interviews be protected and stored?
- Are there any issues in accuracy of transcriptions of recordings which may lead to interpretation problems?
- How will potentially controversial views expressed by some of the participants be represented and interpreted?
## MODULE 4: REPORTING

### MULTIPLE-CHOICE QUESTIONS

<table>
<thead>
<tr>
<th>Question</th>
<th>Possible answers</th>
<th>Feedback</th>
<th>Subject tracks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of the following would likely result in retraction of a paper?</td>
<td>A dispute that erupts about the order of authors listed</td>
<td>This form of misconduct would require retraction of the paper.</td>
<td>All</td>
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<tr>
<td></td>
<td>A reviewer of the original manuscript who makes herself known to the authors</td>
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<td>The discovery that the research involves falsified data [CORRECT ANSWER]</td>
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<td></td>
<td>Subsequent research by others that produces contrary results</td>
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<td></td>
<td>The discovery that three references were omitted from the reference list</td>
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<tr>
<td>Why is plagiarism a serious offence?</td>
<td>Because it involves a conflict of interest</td>
<td>Plagiarism is theft of another’s ideas by not giving the original author credit.</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Because it is uncovered by plagiarism-detection software</td>
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<tr>
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<td>Because it is sometimes undetected</td>
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<td>Because it misrepresents someone else’s words or ideas as your own [CORRECT ANSWER]</td>
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<td>Because it can be uncovered years after the fact</td>
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<tr>
<td>The integrity of the publication process rests on accuracy and fairness. Which of the following is most critical to maintaining accuracy and fairness in the system?</td>
<td>Using the right bibliographic format for references</td>
<td>Full and accurate disclosure of research results and of the people responsible for them is of critical importance.</td>
<td>All</td>
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<td>Presenting research results fully and clearly and identifying the researchers responsible for the research [CORRECT ANSWER]</td>
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<td>Providing prompt reviews of research</td>
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<td></td>
<td>Identifying authors by their full names and institutional affiliations on all publications</td>
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<td>Punishing plagiarism when discovered</td>
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</table>

### ADDITIONAL ESSAY/CASE STUDY SUGGESTIONS

**Avoiding plagiarism**

- **Duration:** 30 minutes
- **Purpose:** To demonstrate that key lessons regarding avoiding plagiarism have been learned.

**Task**

Write an appropriate paraphrase of a passage in the research literature, using the proper citation format for your field. Present both the original and your paraphrase.

**Review**

- **Duration:** 60 minutes
- **Purpose:** To develop the skills required to review others’ work and, in so doing, become familiar with the publication standards of a relevant journal.

**Task**

Write a review of a manuscript using a specific journal’s publication standards and review criteria.
Note
(This exercise can be expanded by asking participants to write two separate reviews, with reference to the standards and criteria of two different journals in the field.)
### Module 5: Responsibilities to Society

#### Multiple-Choice Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Possible answers</th>
<th>Feedback</th>
<th>Subject track</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of the following is the best way to ensure you are being socially responsible as a researcher?</td>
<td>Take every opportunity to make your opinion on social issues known</td>
<td>While it is difficult to set out basic standards for social responsibility, one thing that researchers can be sure to take care of is staying within their expertise.</td>
<td>All</td>
</tr>
<tr>
<td></td>
<td>Find an important social issue and make sure your research addresses it</td>
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<td></td>
<td>Acknowledge that your expertise is limited and ensure that you make it clear when going beyond it [CORRECT ANSWER]</td>
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<tr>
<td></td>
<td>Focus on your research and don’t worry about social issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accept that standards regarding social issues are ambiguous and that researchers cannot therefore be expected to adhere to them</td>
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</table>

#### Additional Essay/Case Study Suggestions

**Case study and reflection:** Synthetic biology (Biomed version)

- **Duration:** 45 minutes
- **Purpose:** To reflect on a recent case study and relate some of the questions it raises to your own field of research.

**Background**

Synthetic biology is a technology that promises to produce powerful results. A synthetic biologist can programme living organisms in the same way a computer scientist can program a computer. Potential positive outcomes include pharmaceuticals that cure major diseases, super crops, clean fuels, restoration of extinct species, and removal of toxic pollutants. The risks are also major: super-pathogens that may prove untreatable; social challenges about how to regard our responsibilities towards new species; and the problems of treating ‘humanity’ as something that can be engineered. There is also the problem of public reactions to – and misperceptions of – the promise and danger of the products of this new technology. One reporter hailed synthetic biology as making it possible ‘to supplant the world created by Darwinian evolution with one created by us’, adding: ‘no scientific achievement has promised so much, and none has come with greater risks or clearer possibilities for deliberate abuse.’ (Specter, 2009)

**Task**

Think about your own research and write a response to the following questions:

- What objections might you face in communicating your research?
- Compare your responsibilities about managing risks and benefits within the research community to those when dealing with the public.

**Feedback:**

- What are the risks and benefits? Take account of the significance of risks as well as the potential benefits in the research. How would you go about ensuring that you had taken account of the full range of societal risks? Think about how you would justify the benefits to someone convinced that the risks outweigh the benefits. Consider how risks and benefits might be perceived by the public. Who do you think you would most need to convince of the value of this research? Is speaking out publicly in support of the value of the work a form of advocacy? How would you ensure that your commitment to the development of the
research did not skew your perspective? How would you ensure that your relative lack of experience in assessing societal risks did not compromise your integrity when seeking to change the opinions of others about the value of the research?

- Validity, rigour, and impartiality are concepts which underpin research methods. These are the ways in which research can produce knowledge verified as reliable. Based on sharing, collaboration, and peer review, the research community is essentially social. If you are dishonest about data or in your authorship, these decisions have an ethical impact on others as well as on disciplines. But the implications extend much wider when your work goes public. This is particularly the case if your research has a direct effect on the lives of others. In considering risks and benefits, at which stage of research – planning, conducting, or reporting – do you think you would need most to think about this?

Reference

Case study and reflection: Synthetic biology (Natural and Physical Sciences version)
- Duration: 45 minutes
- Purpose: To reflect on a recent case study and relate some of the questions it raises to your own field of research.

Background
Synthetic biology is a technology that promises to produce powerful results. A synthetic biologist can programme living organisms in the same way a computer scientist can program a computer. Potential positive outcomes include pharmaceuticals that cure major diseases, super crops, clean fuels, restoration of extinct species, and removal of toxic pollutants. The risks are also major: super-pathogens that may prove untreatable; social challenges about how to regard our responsibilities towards new species; and the problems of treating ‘humanity’ as something that can be engineered. There is also the problem of public reactions to – and misperceptions of – the promise and danger of the products of this new technology. One reporter hailed synthetic biology as making it possible ‘to supplant the world created by Darwinian evolution with one created by us’, adding: ‘no scientific achievement has promised so much, and none has come with greater risks or clearer possibilities for deliberate abuse.’ (Specter, 2009)

Task 1
Consider this case from the following perspectives:

- What objections might you face in communicating your research?
- Compare your responsibilities about managing risks and benefits within the research community to those when dealing with the public.
- From what you have read above, do you think the Specter quotation is justified? What influence might that quotation have on your response to this area of research, and what might Specter’s rationale have been in making it?

Feedback:
- What are the risks and benefits? Take account of the significance of risks as well as the potential benefits in the research. How would you go about ensuring that you had taken account of the full range of societal risks? Think about how you would justify the benefits to someone convinced that the risks outweigh the benefits. Consider how risks and benefits might be perceived by the public. Who do you think you would
most need to convince of the value of this research? Is speaking out publicly in support of the value of the work a form of advocacy? How would you ensure that your commitment to the development of the research did not skew your perspective? How would you ensure that your relative lack of experience in assessing societal risks did not compromise your integrity when seeking to change the opinions of others about the value of the research?

- Validity, rigour, and impartiality are concepts which underpin research methods. These are the ways in which research can produce knowledge verified as reliable. Based on sharing, collaboration, and peer review, the research community is essentially social. If you are dishonest about data or in your authorship, these decisions have an ethical impact on others as well as on disciplines. But the implications extend much wider when your work goes public. This is particularly the case if your research has a direct effect on the lives of others.

Task 2
Synthetic biology may seem an extreme case, but it is not the only area of research that has given rise to controversy. Take a look at the following links to read about the debate about publication restrictions on bird flu research:


Reflect on how the bird flu debate relates to the synthetic biology case study outlined above. What problems did the researchers face in communicating the results of their research on bird flu? What were the potential risks and benefits of their research?

Reference

Case study and reflection: Synthetic biology (Engineering and Technology version)

- **Duration:** 45 minutes
- **Purpose:** To reflect on a recent case study and relate some of the questions it raises to your own field of research.

**Background**
Synthetic biology is a technology that promises to produce powerful results in the future: the ability for a synthetic biologist to programme living organisms in the same way a computer scientist can program a computer. Potential positive outcomes include pharmaceuticals that cure major diseases, super crops, clean fuels, restoration of extinct species, and removal of toxic pollutants. The risks are also major: super-pathogens that infect human cells; social challenges about the rights of or responsibilities to new species; and the problems of treating ‘humanity’ as something that can be engineered.

**Task**
Consider this case from the following perspectives:
What objections might a researcher in this field face in communicating their research?

Compare a researcher’s responsibilities about managing risks and benefits within the research community to those when dealing with the public.

Feedback:
For a researcher in this field, it is very important to take account of the significance of risks as well as the potential benefits in the research. In his or her shoes, how would you go about ensuring that you had taken account of the full range of societal risks? Think about how you would justify the benefits to someone convinced that the risks outweigh the benefits. Consider how risks and benefits might be perceived by the public. Who do you think you would most need to convince of the value of this research? Is speaking out publicly in support of the value of the work a form of advocacy? How would you ensure that your commitment to the development of the research did not skew your perspective? How would you ensure that your relative lack of experience in assessing societal risks did not compromise your integrity when seeking to change the opinions of others about the value of the research?

For a researcher in any field, validity, rigour, and impartiality are concepts which underpin research methods. These are the ways in which research can produce knowledge verified as reliable. Based on sharing, collaboration, and peer review, the research community is essentially social. If you are dishonest about data or in your authorship, these decisions have an ethical impact on others as well as on disciplines. But the implications extend much wider when your work goes public. This is particularly the case if your research has a direct effect on the lives of others. In considering risks and benefits, at which stage of research – planning, conducting, or reporting – do you think you would need most to think about this?

Reference

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<th>Case study and reflection: Public decision-making (Social and Behavioural Sciences)</th>
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<td><strong>Duration:</strong> 45 minutes</td>
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<td><strong>Purpose:</strong> To reflect on some of the implications of being involved in public decision-making in your capacity as a social and behavioural sciences researcher.</td>
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**Background**
Social scientists are sometimes called on to give advice or make recommendations in the public arena on the basis of their expertise. They may be asked about the implications of their research for matters of public policy, governmental intervention, societal change, economic planning or educational initiatives. Social scientists who have worked for years in academic or other research may find themselves suddenly called upon to participate in critical decisions that could benefit from their specific expertise. For example, when wars erupt in far-flung parts of the world, regional experts may be called upon to inform governmental or military strategy. New developments for communities, schools, hospitals or specific populations may benefit from researchers’ special knowledge.

**Task**

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Write a few paragraphs outlining your reflections in response to the following questions:

- If you were called upon to contribute to public decision-making on the basis of your expertise, how would you go about doing this without compromising your integrity?
- What benefits and risks to the public might arise in the context of your involvement as an expert in public arenas?

Feedback:
There are a number of questions to consider here:

- How would you ensure that you had taken account of the full range of potential risks, as well as the potential benefits for society? How might you justify the benefits to someone convinced that the risks outweigh the benefits? Consider how risks and benefits might be perceived by the public. For example, if you were asked to advise on governmental policy, what steps would you take to be sure that your research findings were separate from your personal opinions about the available alternatives?
- Who do you think you would most need to convince of the value of your research? Is speaking out publicly in support of the value of your work a form of advocacy? How would you ensure that your relative lack of experience in assessing societal risks did not compromise your integrity when seeking to change the opinions of others about the value of the research?
- How would you ensure that your commitment to the development of the research did not skew your perspective? If your work might affect schools or hospitals, for example, how might your interest in helping the involved populations influence what advice you give?

Validity, rigour, and impartiality are concepts that underpin research methods. These are the ways in which research can produce knowledge verified as reliable. Based on sharing, collaboration, and peer review, the research community is essentially social. If you are dishonest about data or in your authorship, these decisions have an ethical impact on others as well as on disciplines. But the implications extend much wider when your work goes public. This is particularly the case if your research has a direct effect on the lives of others. Your work might affect the general public or it might be relevant to specific populations, such as schoolchildren, communities, prisoners, employees in a given industry or sector, elders, patients, and so on. In considering risks and benefits, at which stage of research – planning, conducting, or reporting – do you think you would need most to think about this?

Case study and reflection: Synthetic biology (Arts and Humanities version)

- **Duration:** 45 minutes
- **Purpose:** To reflect on a recent case study and relate some of the questions it raises to your own field of research.

This case study uses a highly relevant and broadly controversial area of research. On the surface, it appears as a purely ‘scientific’ case. In fact,
synthetic biology has received much attention from humanities researchers, particularly ethicists, and has started to find its way into the work of artists and writers, because of its suggestive power about the future of the ‘human’.

Background
Synthetic biology is a technology that promises to produce powerful results. A synthetic biologist can programme living organisms in the same way a computer scientist can program a computer. Potential positive outcomes include pharmaceuticals that cure major diseases, super crops, clean fuels, restoration of extinct species, and removal of toxic pollutants. The risks are also major: super-pathogens that may prove untreatable; social challenges about how to regard our responsibilities towards new species; and the problems of treating ‘humanity’ as something that can be engineered. There is also the problem of public reactions to – and misperceptions of – the promise and danger of the products of this new technology. One reporter hailed synthetic biology as making it possible ‘to supplant the world created by Darwinian evolution with one created by us’, adding: ‘no scientific achievement has promised so much, and none has come with greater risks or clearer possibilities for deliberate abuse.’ (Specter, 2009)

Task
Imagine that you have been asked to comment on the issues raised by synthetic biology from the perspective of the humanities; or, as a creative artist, have been asked to contribute work to an interdisciplinary event featuring interpretations of a future where synthetic biology has been highly developed.

Consider this case from the following perspectives:

- Does your humanist or creative outlook highlight aspects of the research which a scientist might overlook? What are they and how might they contribute to the wider ethical debate?
- Should you declare your personal opinion explicitly if it is strongly in favour or strongly against the further development of synthetic biology? How could you go about providing valuable insights from your discipline’s perspective that clearly distinguish between your personal opinion and your professional expertise?
- How would you need to be careful in engaging with the public and the media on this topic?

Feedback:
- What are the risks and benefits to human beings and to society from the perspective of the humanities or arts? As a researcher with an interest in the human condition, it is likely that you will have an insight into the risks and benefits of this new technology to the ways in which human beings live and conduct their lives. Consider how such risks and benefits might be perceived by the public. The impact of the sciences on society is not merely a scientific matter. If you focus on the appropriate aspects of this new research, you can explore the possibilities from the perspective of your own discipline and use your insights to widen the debate on synthetic biology.
- Speaking outpublicly in support of the value – or otherwise – of the research is a form of advocacy. As you are not an expert in the science of the research area, you would need to present the
perspective of your discipline carefully and be able to justify it. If your personal opinion is that this research area is overwhelmingly positive or negative, then you would need to be even more careful. Make it clear that your own expertise lies in a subject not directly involved with the research area itself. You could focus on those aspects of benefits or risks which are directly addressed by your discipline and expertise, for instance. Who do you think you would most need to convince of the validity of your argument? How would you ensure that your relative lack of experience in the area of the research you are commenting on does not compromise your integrity? If you seek to influence the opinions of others, you must be explicit about your own assumptions and opinions.

- The implications of what you say have the potential to be compromising when you start engaging outside the academic domain. When you go public you need to think about your audience very carefully. This is particularly the case if the research has a direct effect on the lives of others. Think about how your discipline would contribute to the task of improving public perception of the research. How clear are you? Are you using highly technical language or presenting ideas in a way that might be misunderstood? Think about how your communications might be interpreted and used by the media. Are you using language and presenting your ideas in a way that could seem ambiguous or that may be taken out of context?

**Reference**

Epigeum is very keen to help with any questions or hear any suggestions for future improvement. Please do not hesitate to get in touch.

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