



Creativity and Research-led Teaching

David J. Adams

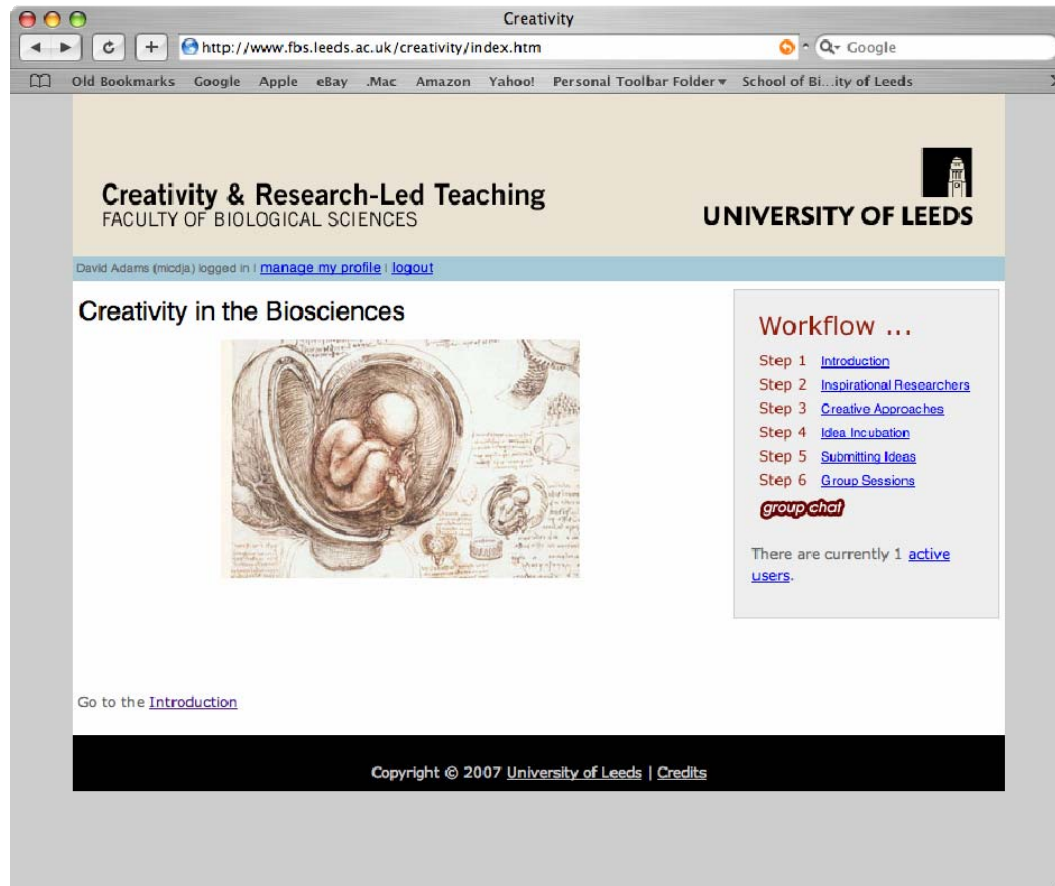
Creativity and Research-led Teaching

FACULTY OF BIOLOGICAL SCIENCES



UNIVERSITY OF LEEDS

Creativity and Research-led Teaching website



The screenshot shows a web browser window with the URL <http://www.fbs.leeds.ac.uk/creativity/index.htm>. The browser's address bar includes a search engine (Google) and a toolbar with various bookmarks like Google, Apple, eBay, Amazon, and Yahoo!. The website header features the title "Creativity & Research-Led Teaching" and the "UNIVERSITY OF LEEDS" logo. A user login bar indicates "David Adams (micdja) logged in" with links for "manage my profile" and "logout". The main content area is titled "Creativity in the Biosciences" and features a historical anatomical illustration of a fetus in a uterus. To the right, a "Workflow ..." section lists six steps: "Introduction", "Inspirational Researchers", "Creative Approaches", "Idea Incubation", "Submitting Ideas", and "Group Sessions". A "group chat" link is highlighted in red. Below the list, it states "There are currently 1 active users." At the bottom left, there is a link to "Go to the Introduction". The footer contains the copyright notice "Copyright © 2007 University of Leeds | Credits".



Creativity and Research-led Teaching website

- Cutting edge research (short films)
- Promotion of creativity in individuals
- ‘Group chat’ and ‘Fridge magnets’
- Structured group sessions

Promoting creativity in individuals

Analogies

Brainstorming and mind-mapping

Challenging assumptions

Clichés and proverbs

Curiosity

Google-storming

Idea dump

Importance of a fresh eye

Personal analogy

Relational words

Two words

Curiosity/inspiration from the unusual



**ISAAC
ASIMOV**

‘The most exciting phrase to hear in science, the one that heralds new discoveries, is not “Eureka” but “That’s funny ...”’

Curiosity/inspiration from the unusual



‘Chance favours only the prepared mind’ –
Louis Pasteur



Challenging assumptions



Dyson



iMac

Creativity in the Biosciences: Creative Approaches

Challenging Assumptions

When to use this: Try this when you think you have exhausted your initial thoughts and ideas and feel the need to adopt a new approach to the problem.


Why: In our initial consideration of a problem we make a number of assumptions about the nature of the task facing us. When attempting creative approaches to problem solving it frequently helps to challenge these assumptions. This strategy has proved highly successful in creative companies like Dyson. Disappointed by the inefficiency of the conventional vacuum cleaner, James Dyson questioned the assumption that these machines should suck air through bags and filters that rapidly become blocked. As an alternative he designed the highly original and efficient dual cyclone machine that spins dust out of the airstream in transparent bins that allow the user to see when the container is full. Clearly, when assumptions are cast aside, new ideas can begin to emerge.

Before moving on try a small test that highlights how we can cling to assumptions

9 Dots

Here is a pattern of dots. Your task is to link up all nine dots using no more than four straight lines and without lifting pen from paper or retracing the lines.

Use the mouse to draw.



Workflow ...

- Step 1 [Introduction](#)
- Step 2 [Inspirational Researchers](#)
- Step 3 [Creative Approaches](#)
- Step 4 [Idea Incubation](#)
- Step 5 [Submitting Ideas](#)
- Step 6 [Group Sessions](#)

group chat

There are currently **1 active users**.

Creative Approaches

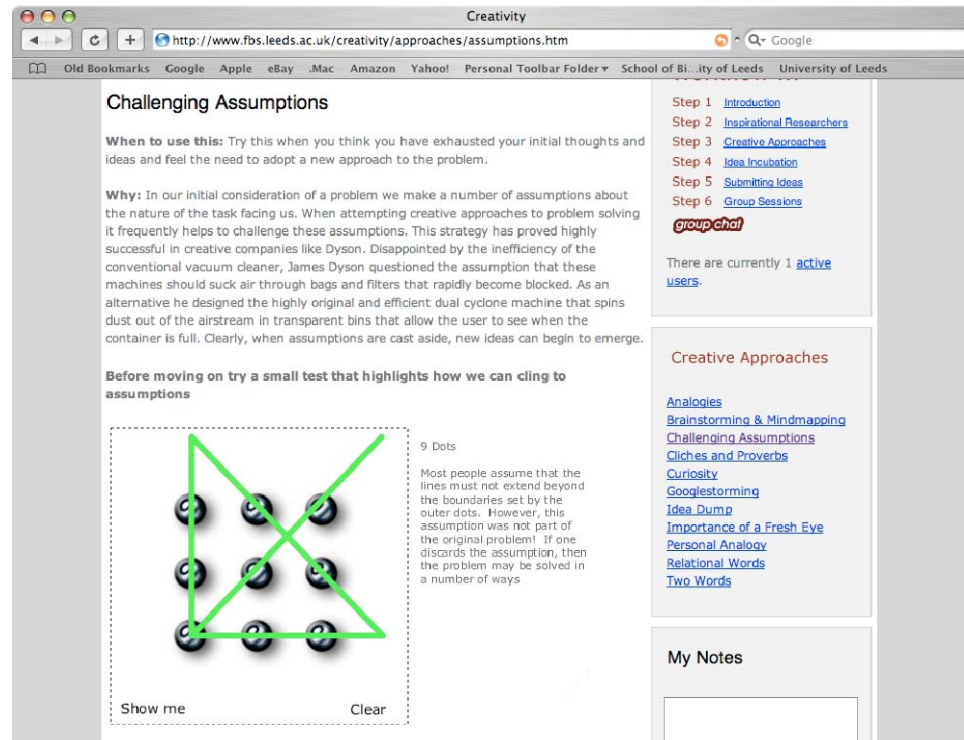
- [Analogies](#)
- [Brainstorming & Mindmapping](#)
- [Challenging Assumptions](#)
- [Cliches and Proverbs](#)
- [Curiosity](#)
- [Googlestorming](#)
- [Idea Dump](#)
- [Importance of a Fresh Eye](#)
- [Personal Analogy](#)
- [Relational Words](#)
- [Two Words](#)

My Notes

Leeds

Challenging assumptions

'THINKING OUTSIDE THE BOX'



The screenshot shows a web browser window with the URL <http://www.fbs.leeds.ac.uk/creativity/approaches/assumptions.htm>. The page title is "Challenging Assumptions".

When to use this: Try this when you think you have exhausted your initial thoughts and ideas and feel the need to adopt a new approach to the problem.

Why: In our initial consideration of a problem we make a number of assumptions about the nature of the task facing us. When attempting creative approaches to problem solving it frequently helps to challenge these assumptions. This strategy has proved highly successful in creative companies like Dyson. Disappointed by the inefficiency of the conventional vacuum cleaner, James Dyson questioned the assumption that these machines should suck air through bags and filters that rapidly become blocked. As an alternative he designed the highly original and efficient dual cyclone machine that spins dust out of the airstream in transparent bins that allow the user to see when the container is full. Clearly, when assumptions are cast aside, new ideas can begin to emerge.

Before moving on try a small test that highlights how we can cling to assumptions

9 Dots

Most people assume that the lines must not extend beyond the outer dots. However, this assumption was not part of the original problem! If one discards the assumption, then the problem may be solved in a number of ways

9 dots puzzle diagram showing a 3x3 grid of dots with lines forming a square and an 'X' shape.

Show me Clear

group chat

There are currently 1 [active users](#).

Creative Approaches

- [Analogies](#)
- [Brainstorming & Mindmapping](#)
- [Challenging Assumptions](#)
- [Cliches and Proverbs](#)
- [Curiosity](#)
- [Googlestorming](#)
- [Idea Dump](#)
- [Importance of a Fresh Eye](#)
- [Personal Analogy](#)
- [Relational Words](#)
- [Two Words](#)

My Notes

Analogy



Hubble telescope

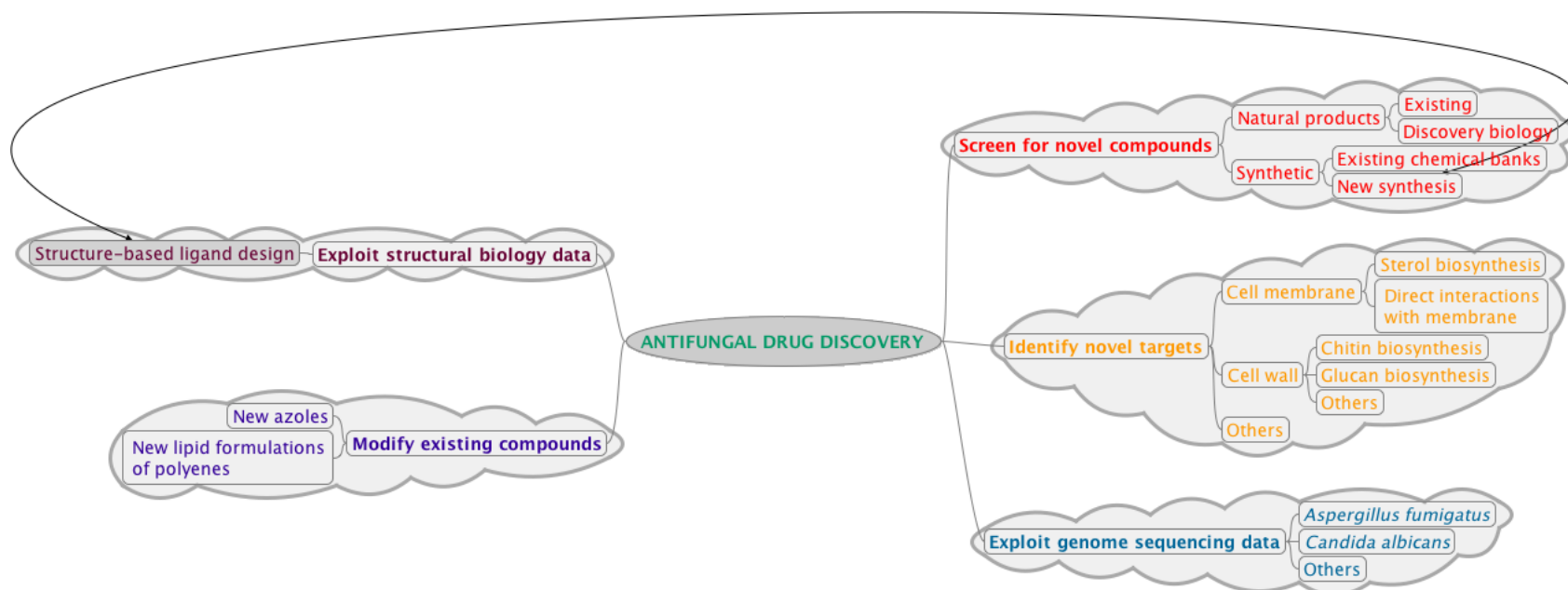


Showerhead

Analogy: bioinspiration



Brainstorming and Mind mapping





Group chat and 'Fridge magnets'

David Adams (modjs) logged in | [manage my profile](#) | [logout](#)

Creativity in the Biosciences: Idea Incubation

- Research scientists and other problem-solvers frequently begin to identify solutions to problems at times and locations remote from those normally associated with the laboratory and workplaces. Periods of 'relaxed attention' in the shower, during sports or other recreational activities, or even during sleep appear invaluable in allowing individuals to sub-consciously consider the problem in hand.
- Try thinking about your problem as you drift off to sleep; solutions may occur to you during the night or in the morning. Whenever possible, it's also worth leaving a gap of a few days between the occasion when you were first made aware of a task and the next session when you will consider the problem, perhaps as a member of a group or team. Inspiration may arrive at any time, day or night so be sure to carry a

Workflow ...

- [Step 1: Introduction](#)
- [Step 2: Inspirational Researchers](#)
- [Step 3: Creative Approaches](#)
- [Step 4: Idea Incubation](#)
- [Step 5: Submitting Ideas](#)
- [Step 6: Group Sessions](#)

There are currently **2** active users.

My Notes

David Adams (modjs) logged in | [manage my profile](#) | [logout](#)

[Back to the list of ideas](#)

Grid | Randomize

- Idea for 'greenind'
- Creativity and postgraduates
- Collaborations with school teachers
- Cross-talk between artists and scientists
- Creativity and industrialists
- Incorporate 'enterprise' exercises

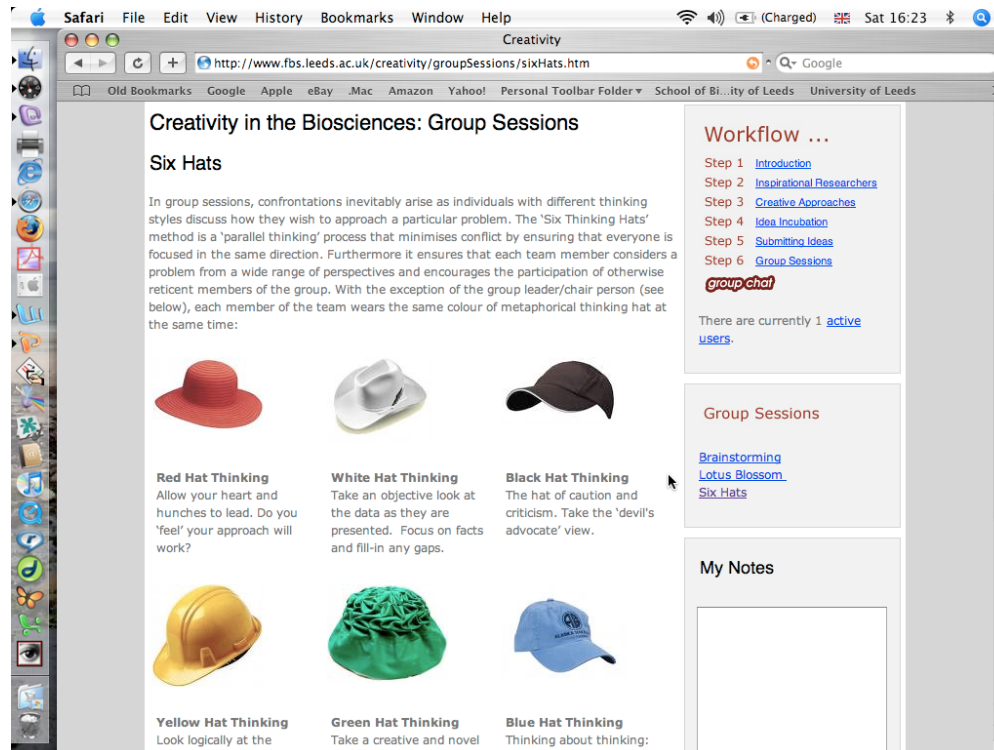
'Fridge magnets'



Promoting creativity in groups

- Group brainstorming
- Lotus blossom
- Six Thinking Hats

Promoting creativity in groups: Six Thinking Hats



The screenshot shows a Safari browser window displaying a webpage. The address bar shows the URL: <http://www.fbs.leeds.ac.uk/creativity/groupSessions/sixHats.htm>. The page title is "Creativity in the Biosciences: Group Sessions". The main heading is "Six Hats". Below the heading is a paragraph explaining the method: "In group sessions, confrontations inevitably arise as individuals with different thinking styles discuss how they wish to approach a particular problem. The 'Six Thinking Hats' method is a 'parallel thinking' process that minimises conflict by ensuring that everyone is focused in the same direction. Furthermore it ensures that each team member considers a problem from a wide range of perspectives and encourages the participation of otherwise reticent members of the group. With the exception of the group leader/chair person (see below), each member of the team wears the same colour of metaphorical thinking hat at the same time:"

The page features six thinking hats arranged in two rows of three:

- Red Hat Thinking**: Allow your heart and hunches to lead. Do you 'feel' your approach will work?
- White Hat Thinking**: Take an objective look at the data as they are presented. Focus on facts and fill-in any gaps.
- Black Hat Thinking**: The hat of caution and criticism. Take the 'devil's advocate' view.
- Yellow Hat Thinking**: Look logically at the...
- Green Hat Thinking**: Take a creative and novel...
- Blue Hat Thinking**: Thinking about thinking:...

On the right side of the page, there is a "Workflow ..." section with a list of steps: Step 1 [Introduction](#), Step 2 [Inspirational Researchers](#), Step 3 [Creative Approaches](#), Step 4 [Idea Incubation](#), Step 5 [Submitting Ideas](#), and Step 6 [Group Sessions](#). Below this is a "group chat" section indicating "There are currently 1 active users." and a "Group Sessions" section with links for [Brainstorming](#), [Lotus Blossom](#), and [Six Hats](#). At the bottom right is a "My Notes" section with a text area.



Creativity and Research-led Teaching website

- Applications in other disciplines
- Inter-disciplinary collaborations
- **THE SITE IS AVAILABLE TO USERS OUTSIDE LEEDS**

<http://www.fbs.leeds.ac.uk/creativity/>

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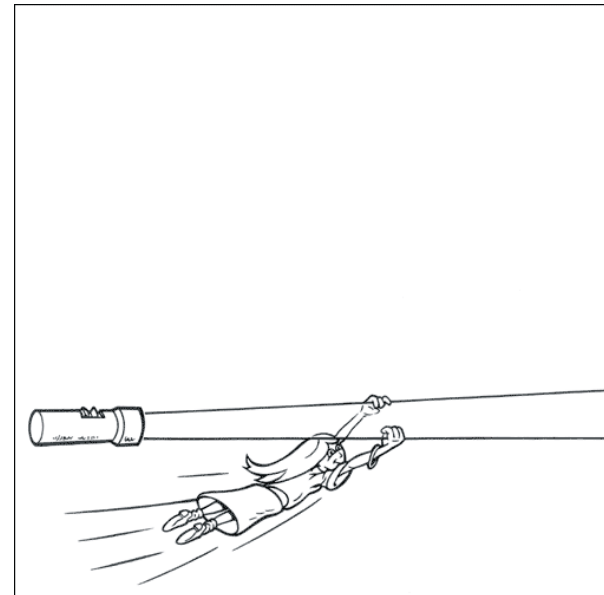
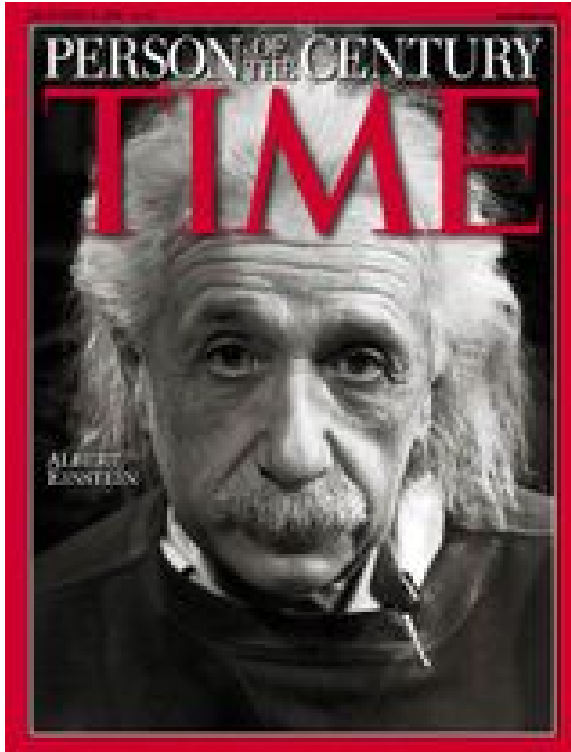
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Personal analogy

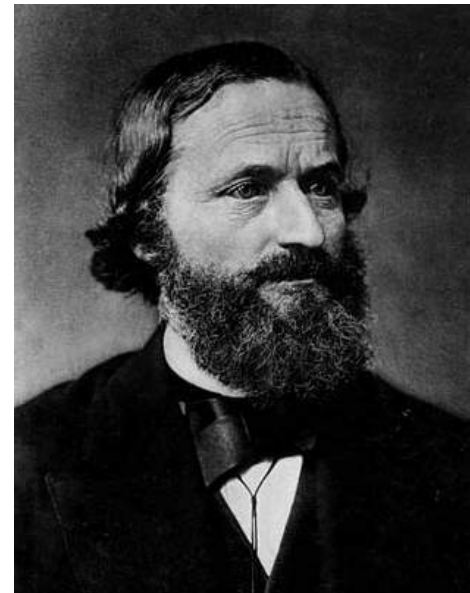


'Riding on a beam of light'

Talk to strangers!



Robert Bunsen



Gustav Kirchhoff

Major breakthroughs in spectroscopy and cosmology

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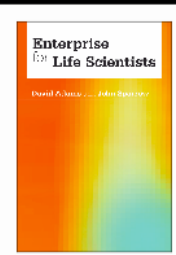


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24th April 06

Enterprise for Life Scientists: *Developing Innovation and Entrepreneurship in the Biosciences*

Editors: *David Adams, Faculty of Biological Sciences, University of Leeds*
John Sparrow, Dept of Biology, University of York



Paperback: **£21.99** (ISBN: 1904842364)
250pp, July 2007

Enterprise for Life Scientists is a new text designed to stimulate and develop entrepreneurial skills in undergraduate and postgraduate students. The book embraces the wide range of approaches and skills integral to the promotion of enterprise learning at an advanced level. Throughout the book, the authors demonstrate to the readers how to generate, assess, fund, communicate, market and protect their ideas.

The book is student-friendly; each chapter starts with a brief overview of the subject and concludes with a list of the salient, take-home points. The main body of the text is punctuated with numerous case studies to aid learning. There are also short profiles/biographical sketches of successful entrepreneurs/innovators included throughout the book.

The book is intended primarily for students but will also prove invaluable to academics seeking to establish and embed enterprise learning in their degree programmes.

Provisional Contents:

- 1) General introduction to bioscience industry *Shane Booth (ANGLE Technology), John Sparrow (Dept of Biology, University of York) and David Adams (Faculty of Biological Sciences, University of Leeds)*
- 2) Knowledge and technology transfer *Shane Booth (ANGLE Technology) and Kathy Armour (Science City, York)*
- 3) Generation of ideas; creativity and innovation in the biosciences *David Adams (Faculty of Biological Sciences, University of Leeds) and Paul Grimshaw (University of Leeds)*
- 4) Protecting ideas *Louise Byass (Central Science Laboratory, York)*
- 5) Researching ideas *David Wilkinson (University of Leeds) and Amanda Selvaratnam (University of York)*
- 6) Communicating ideas *Samantha Appinal and David Wilkinson (University of Leeds)*
- 7) Defining your business and funding your ideas *David Baynes and Louise Pymar (BioFusion, Sheffield)*
- 8) Starting-up a business *Allison Price and Ted Samiento (Leeds Metropolitan University)*
- 9) The role of the business plan *Andrew Ferguson (University of York)*
- 10) Regulation in the biosciences *Nick Medcalf (Smith-Hughes) and Robert Piotrowski (David Begg Associates)*
- 11) Ethical issues *Rob Lawlor (Interdisciplinary Ethics Team, University of Leeds)*

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