

RESEARCH METHODS MADE SIMPLE

Stories, Games & Puzzles to Help You Understand

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SAMPLE

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ABOUT THE AUTHOR

Dr Catherine Dawson studied at university in the UK for an undergraduate degree in Combined Humanities, a Master's degree in Social Research and a PhD researching the learning choices of adults returning to education. She has worked as a research assistant, research associate and educator at various UK universities and as a research and training officer in both the public and private sectors. Over the years she has developed and taught research methods courses for undergraduate and postgraduate students and has designed and delivered bespoke research methods courses to employees in the private sector. At this present time, Catherine is writing online courses in research methods for postgraduate students and continuing to write research methods books for students and educators.

SAMPLE

INTRODUCTION

Welcome to *Research Methods Made Simple: Stories, Games & Puzzles to Help You Understand*. This book is different from the norm. It introduces you to research methods in a creative and entertaining way by using activities, stories, games and visualization. It is a unique type of book that makes learning enjoyable and memorable. Complex text, terms, tables and equations, which can be daunting and overwhelming, have no place in this book. Instead, core principles and practicalities are introduced through activities, images and visualization. You are encouraged to get involved and learn through action rather than read and digest chapters of complicated text. This enables you to gain deeper insight, develop your understanding, overcome blocks, build motivation and enjoy your learning.

The content is guided by questions that have been asked by students on my research methods courses over the years. You can adopt a pick and mix approach, choosing areas that are of most interest, or those that answer specific questions you might have. You can do this simply and quickly as clear signposting is provided and chapters are divided by relevant and coherent topics. Or you can choose to work through the book from beginning to end: it flows in a logical order, taking you through the various steps required in research and testing your understanding of each step before moving to the next one.

Activities, stories and games cover a variety of subject areas and disciplines, which means that the book has relevance if you are studying in the arts, social sciences or sciences. They include undergraduate and postgraduate study, with practical examples and scenarios from students and research communities around the globe. Important ethics and integrity issues are introduced in concise, informative and relevant thought boxes, and interesting student and tutor tips appear throughout. 'Go further' boxes provide useful information and guidance about videos, podcasts and further reading to help you find out more about a particular topic.

The book enables you to build your understanding so that you feel comfortable moving forward with your research. It will also help you to understand the relevance of research methods to your course, your research and your personal and professional life. Research can be exciting and fun: don't be deterred by complex terms and off-putting statistics. Instead, work your way through the activities, read the stories and embark with enthusiasm on your research journey. Good luck with your research: I wish you every success and hope that you enjoy your research as much as I have done.

1

REFLECTION – LET’S THINK ABOUT THIS THING CALLED RESEARCH ...

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CHAPTER OBJECTIVES

By the end of this chapter, you will be able to:

- Explain what research is
- Discuss the purpose of research
- Describe how research starts and ends
- Explain how research builds on research
- Illustrate how research can be used and abused, and explain how to avoid this
- Summarize the reasons why students undertake research
- List the benefits to be gained from undertaking research
- Provide practical examples of different types of student research project

A really good place to start your research journey is at the beginning. This might seem a very odd thing to say, but it needs to be said. This is because some research methods education does not start at the beginning. It expects a certain amount of knowledge and understanding, and moves straight into the complex worlds of methodology and method. You are not given the basics:



Figure 1.1 Research image

a grounding in the foundational questions and concepts, the ‘why’ and ‘what’ of research. Omitting this can be confusing, off-putting and demotivating. Also, as your course moves forward, it is easy to get left behind if you do not have a sturdy foundation.

Sometimes, you are expected to undertake research for your course without knowing why. Why should you do research? What is its purpose? Why is it important? These questions are often taken for granted and it can be confusing for those of you who need to know more about this before you start to think about how you actually do your research. If we start at the beginning (a very logical place to start) it will help you to gain a deeper understanding of this thing called research.

This chapter takes you through some of the foundational questions you might have about research (see Figure 1.1). They are all questions that have been asked by my research methods students in the past. It will help you to understand more about what research is and why it is done; who does research; how it can be misused and abused; and how it starts and ends.

WHAT IS RESEARCH?

I am always very pleased with my students when they ask, ‘What is research?’. Some of the group might look surprised at the question, whereas others nod in agreement. It’s a great way to start a course and a perfect way to start a research methods book. The question is perhaps best answered through a real-world example. Let me tell you a story ...

Activity 1.1: Story

Liyana had to go into hospital for surgery on her stomach. As part of her recovery, she started walking. On the first walk, people were very friendly, wishing her good morning and smiling. On the second day, the same. And on the third. She really began to notice and she was happy. People were being very nice. Why? Not that people in her home town weren’t friendly, but they were being more friendly than usual.

Perhaps it was Liyana herself? She’d had quite a serious operation and come out of it alive and well. Maybe she was being overly friendly with her new lease of life and people were responding to that? The next day she looked out for clues. But no, she wasn’t the first to smile or say good morning, they were.

What else could be different? Perhaps the weather? Liyana thought back to the weather on these walks. No, she had experienced all types of weather and people were still being friendly, even when it was pouring with rain. It must be something else. But what?

Reflection – this thing called research ...

Liyana spent a few days taking notice of how friendly people were on the walk and she was baffled. Perhaps it was time to forget about it and just be pleased that people were being so pleasant?

Then, for no apparent reason, it all changed. People weren't being so friendly. The odd one or two would smile and say good morning, but many wouldn't. What had changed? Why were they behaving so differently over such a short space of time?

Liyana thought long and hard. Something must be different. Then she had a brainwave. Surely that wasn't it? But it was worth a try. The next day she tested out her idea. And yes, all of a sudden people were being friendly again. The following day she changed that one thing again and yes, people were being less friendly.

Clothes. Surgery on her stomach meant that Liyana couldn't wear anything around her waist for a few weeks, so she'd bought three dresses. She'd been walking in them from the start but, once she'd recovered, she reverted back to T-shirts and jeans. And then people were less friendly. When she changed back into a dress, people were more friendly.

Liyana was surprised. This observation raised many questions:

- What was happening?
- Was she holding herself differently, or acting differently, because she was wearing a dress?
- Were people perceiving her to be more approachable or friendly because she was wearing a dress?
- Do people feel more comfortable with women who wear dresses?
- Do people think a woman deserves more respect if she wears a dress?
- Would the same happen if a man or a trans or non-binary person wore a dress?
- How do people react to the different clothes worn by women, men, trans and non-binary people?
- Does this occur only in the society, culture or country in which Liyana lives?
- Would reactions be different within other societies, cultures or countries?
- Are people conscious of their reactions to what others wear?
- Do different styles, colours or fabrics of dress get different responses?
- Can we predict what type of outfit would get what type of response?

Liyana was starting to do research by making this observation, testing her ideas and asking questions. Perhaps, after having read this story, you might have some other questions about what she observed. Or perhaps you might want to question the way she developed and tested her idea (see Figure 1.2). This is important. It will help you to think about the research process and illustrates that research builds on research: we will return to this later in the chapter.

If we want to do research, we might observe, question, explore, test, hypothesize, model or predict, and we do this in a disciplined and scientific way. This might sound

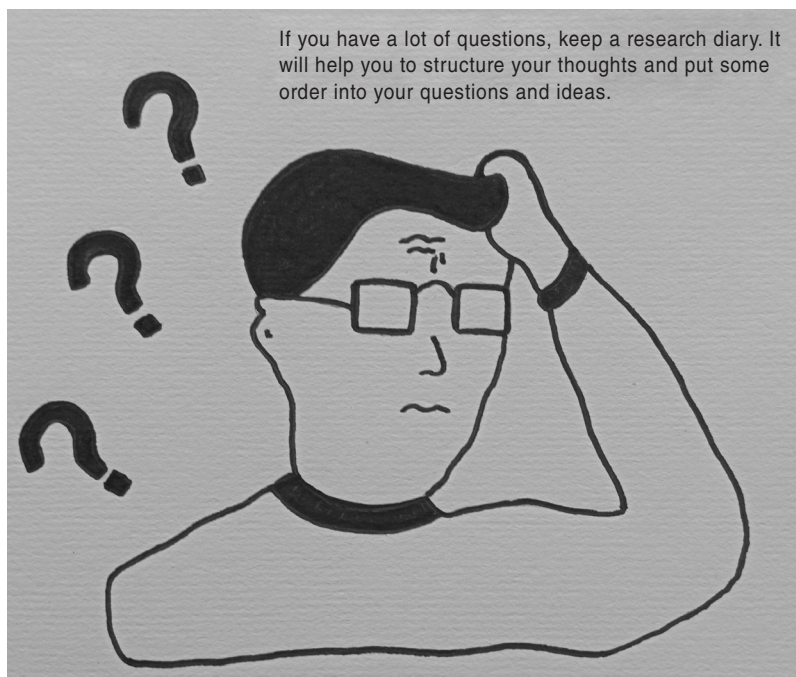


Figure 1.2 Questions image

daunting, but it's not. There are plenty of practices, procedures, instructions and advice that we can follow to help us carry out good, effective, valid and ethical research that other people value and trust. This book guides you through these issues.

THINK ETHICS 1.1

Research ethics refers to the moral and ethical principles that govern and guide all types of research. You must think about ethics throughout your project, from planning and design to implementation and reporting. 'Think ethics' boxes appear throughout this book, helping you to consider important ethical issues that will enable you to respect human dignity, privacy and rights; consider the ethics of consent and purpose; evaluate bias with reference to equality, diversity and inclusion; and address issues of confidentiality and anonymity when collecting and analysing data.

Think about the words we use. Research can be described in many different ways. It is both a noun and a verb: a thing and an activity. Activity 1.2 will help you to think about this in more detail.

Reflection – this thing called research ...

Activity 1.2: Word search

Below are 20 words that can be used to describe research (or the activity of conducting research). They are nouns and/or verbs. Find them in the puzzle before checking the answers, which can be found at the end of the chapter.

analysis
discover
examine
experiment
explain
explore
find
inquire
inspect
investigate
probe
question
review
scrutinize
search
solve
study
synthesis
test
theorize

SAMPLE

WHY DO WE DO RESEARCH?

We do research for many different reasons. Activity 1.3 will help you to think about what these reasons might be.

D S V Q U E S T I O N Y C Q J
 R T D E X P E R I M E N T W N
 L U N R H I E K E N B D I A Y
 S D Q X E V N X T X A X N P V
 Q Y X S O V P S P K A B Q Z M
 R A N C C I I T P L T M U U W
 W Y S T E R S E L E O D I A T
 S I R T H E U S W P C R R N H
 D M I N V E S T I G A T E A E
 Y V N L Z X S K I V B B D L O
 M V O S T N L I M N O N M Y R
 A S E A R C H P S R I J F S I
 I J E B R S B O P F T Z X I Z
 E W I D M G M M T Q M R E S E
 I B D F Q E X P L A I N G Z R

Activity 1.3: Missing-word puzzle

Complete this missing-word puzzle by filling in the blanks from the list of words provided. It will help you to think about why we do research. Answers can be found at the end of the chapter.

Research is an intellectually stimulating process that helps us to answer [____], solve [____], improve decision-making and tackle many of the issues faced in the world today. It is an innovative and creative process that enables us to generate, build and advance [____] and ideas.

Research inspires us to work together on a national and [____] basis. It facilitates the cross-fertilization and generation of ideas and encourages us to transfer and [____] skills, techniques, equipment and knowledge.

Research benefits [____], communities, society, industry, the economy and the environment. It enables us to combat disease, increase life expectancy, become more energy

Reflection – this thing called research ...

efficient and understand how to stop wasting precious resources. Through research we can improve our mental health, understand how people interact and work out what makes us tick. It is a way to combat lies and provide evidence for the [_____].

individuals

international

knowledge

problems

questions

share

truth

HOW IS RESEARCH USED AND ABUSED?

Research that is carried out with integrity and high levels of professionalism benefits people, communities, industry and the environment. It is trusted and respected and leads to the advancement of knowledge and humanity. Poor research, or pseudo-science, can be used to manipulate, mislead or perpetuate falsehoods. It can give researchers a bad name and lead to lack of trust in experts. Therefore, it is imperative that you act with integrity and high levels of professionalism when undertaking research. Activity 1.4 will help you to think about these issues in more detail and the 'Think integrity 1.1' box explains more about what is meant by integrity.

Activity 1.4: Checklist (right and wrong answers)

Work through the following list, putting 'yes' next to the statements you think are correct and 'no' next to those you think are wrong. This will help you to think about how research can be used and abused, by researchers and by others. Answers and explanations can be found at the end of the chapter.

Statement (yes or no)

Researchers must identify and declare conflicts of interest.

It is not necessary to declare who has funded a research project.

Researchers should not criticize other science without justification and evidence.

Research methods made simple

Researchers should allow their political opinion to influence their research.

Media and social media can sometimes misrepresent good research.

It is important to know the original source of research.

Researchers must back up statements with evidence.

All research methods must be well documented and clear to see.

Researchers should use conjecture when reporting their results.

Politicians sometimes quote research that goes against their political beliefs.

Tabloid newspapers prefer research that has a sensationalist or newsworthy headline.

Research findings should be placed in context.

Researchers should stretch findings to make them a little more publishable.

THINK INTEGRITY 1.1

The term 'research integrity' covers the professional standards, codes and practice along with the moral principles required to conduct research to the highest standards. This enables researchers to build trust and confidence in their research methods and outputs. 'Think integrity' boxes appear throughout this book, helping you to consider important integrity issues that will enable you to: view integrity as an individual and collective responsibility; foster research integrity through practice; cultivate transparency and openness; and avoid research misconduct (see Figure 1.3).

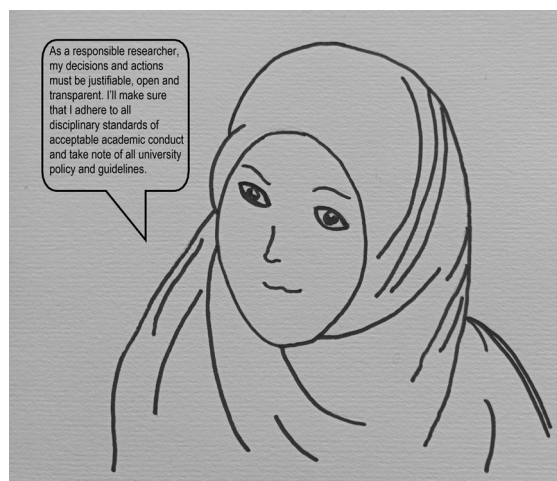


Figure 1.3 Responsible research image

GO FURTHER 1.1

Sanne Blauw, on TEDxMaastricht, has produced an interesting video on the misuse of statistics in the media: 'How to defend yourself against misleading statistics in the news': www.youtube.com/watch?v=mJ63-bQc9Xg [accessed 17 June 2022].

You can find out more about the misuse of science and statistics in the news, by politicians and others, by visiting Bad Science (www.badscience.net). This is a website containing articles, videos and blogs about bad science, produced by Dr Ben Goldacre [accessed 17 June 2022].

You can find out more about the use, abuse and misuse of statistics in the news and everyday life by listening to *More or Less*. This is a radio programme that is broadcast on BBC Radio 4 in the UK, produced together with the Open University. Downloads and podcasts are available from the BBC website (www.bbc.co.uk/programmes) [accessed 17 June 2022].

WHERE DOES RESEARCH START?

In Activity 1.1 Liyana's research started with an observation. But there are other ways that research can start. Figure 1.4 and Activity 1.5 help you to think about them in more detail.

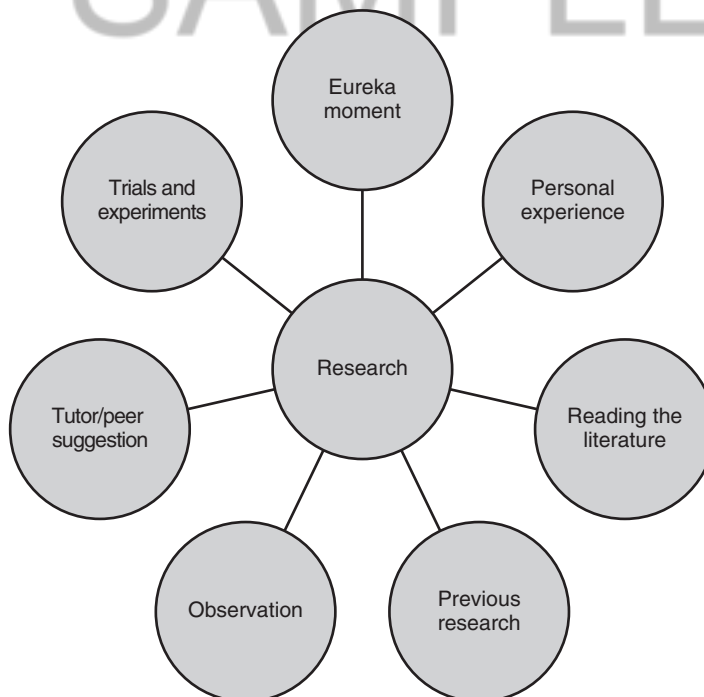


Figure 1.4 Research origins

Activity 1.5: Reflection

The items in Figure 1.4 are not exhaustive. Can you think of any other ways in which research can start? How will *your* research start? Jot down, or make a voice note of, any other ways you can think of. We return to this issue in more depth in Chapter 6, where specific examples of research projects and their origins are given in Activity 6.6.

WHAT DOES RESEARCH DO?

Research answers a research question. This is a specific and actionable question around which the research is centred. It develops from the initial idea, which could have arisen from any of the starting points given in Figure 1.4, or from somewhere else.

Let's look again at Liyana's story in Activity 1.1 and consider how she might develop a research question. Activity 1.6 will help you to do this.

Activity 1.6: Practical examples

Read and digest the following examples to get a better understanding of how Liyana's observations lead to different research questions, depending on what she is studying. Once you have done this, try thinking about other subjects and consider how they might generate different research questions from Liyana's observations.

Example 1

Liyana is studying a course on Fashion Buying and Merchandising. Her observations lead her to think about whether it might be possible to understand and perhaps predict dress-buying behaviour by women in the UK. Her first try at a research question is: 'How do women in the UK behave when making decisions about which dress to buy?' This can be described as exploratory research.

Example 2

Liyana is studying Sociology. Her observations lead her to think about what might influence the way people perceive women wearing dresses. Her first try at a research question is: 'What are the sociological, psychological and structural factors

Reflection – this thing called research ...

that have an influence on the way people perceive women wearing dresses in the UK?' This is exploratory research, but it could also be theory-building research, if Liyana goes on to develop theory from her findings (this could be for postgraduate study, for example).

Example 3

Liyana is studying a course on Textile and Design. She is interested in finding out whether different types and colours of fabric can enhance mood. Her first try at a research question is: 'What effect does the colour and type of fabric have on the mood of the wearer?' In this research Liyana intends to develop different types and colours of fabrics, which will then be tested on participants. This is experimental research in which variables are measured, calculated and compared.

Example 4

Liyana is studying Social Psychology. Her observations lead her to contemplate the possibility that people treat women with more respect if they are wearing a dress. Her first try at a research question is: 'Are women who wear dresses treated with more respect than women who wear trousers?' This is theory-testing research. Liyana has developed a hypothesis that she wants to test to see whether it is correct.

GO FURTHER 1.2

Straightforward, clear and simple advice about producing a research question can be obtained from O'Leary, Z. (2018) *Research Question (Little Quick Fix)*. London: Sage.

For more comprehensive coverage of the topic, consult White, P. (2017) *Developing Research Questions*, 2nd edition. London: Red Globe Press.

Liyana's examples illustrate that the same observation leads to different types of research, and these different types of research can be influenced by a number of factors, including discipline, subject of study, previous experience and personal interest. You will see, later in this book, that these different types of research give rise to, or require, different ways of doing research.

Figure 1.5 gives some more real-life examples from a variety of disciplines, to help you understand this a little better. Note that they have been written as statements rather than questions, which is often easier for students to undertake. If you struggle to develop a research question, try producing a statement first, then turn it into a question. Activity 1.7 will help you to do this.

Research methods made simple

I'm going to carry out exploratory research. I want to find out how images are used in computer games to engage and motivate players. I don't have any prior assumptions or hypotheses to test. **Adam: exploratory research**

I am interested in the potential dangers of synthetic dyes in baked foods sold in India. I intend to find out whether there are any adverse effects on health from these dyes. **Marsha: experimental research**

My research is going to test the theory that violent films lead to aggressive behaviour in adults in the US. I want to find out if this theory provides a plausible explanation for aggression and violence. **Jamil: theory-testing research**

I want to predict the output of a new type of solar panel by using modelling and simulation techniques. I will be able to model output power and approximate generated power. **Jenny: predictive research**

My research is about coping strategies of people with respiratory illnesses in Singapore. I want to describe their experiences, instabilities and vulnerabilities and show how they cope with these from day to day. **Olek: descriptive research**

Figure 1.5 Research project examples

Activity 1.7: Application

Once you have read the examples in Figure 1.5, practise turning each one into a research question.

More information about producing a research question is provided in Chapter 6, where you can find out the qualities of a good research question and consider what constitutes a good or bad research question.

WHO DOES RESEARCH?

All sorts of people do research. These people might work or study in universities or research centres, or they might work in industry, the charitable sector or private companies, for example. Activity 1.8 will help you to think more about who these people are.

Reflection – this thing called research ...

Activity 1.8: Word search

Fifteen words are listed below. They refer to types of people who do research. Find them in the puzzle (see p. 16) before checking the answers, which can be found at the end of the chapter.

analyst

artist

businessperson

chemist

doctor

entrepreneur

historian

layperson

musician

nurse

physicist

scientist

student

teacher

technician

SAMPLE

WHERE DOES RESEARCH END?

The simple answer is that research ends when the research question has been answered and the research has been written up and/or reported. This is the case for most student projects. We will discuss these aspects of the research process later in the book.

However, research never really ends. It's a continual process of refining, adding, learning, reviewing, developing and growing. One researcher might finish their project, but another might choose to continue the work at a later date. Or they might feel that the work needs improvement. Or that the work is incorrect. Research builds from research. This is why it is important to think about how your research could be improved and expanded at a later date. It also shows that you are aware of the wider

M U S I C I A N R P P K I L
L A Y P E R S O N L H P J D
O F X J T F A N A L Y S T J
P W X M V V N N U R S E G O
X S T U D E N T F Z I E B S
T C G L T E C H N I C I A N
J I T E A C H E R J I N D J
Z E S T R K Q O X U S R M K
W N W Y Y U T V A R T I S T
C T E T O C H E M I S T G P
H I S T O R I A N F B V L Q
Y S J D W V L N Y U C E D Q
Q T E N T R E P R E N E U R
B U S I N E S S P E R S O N

picture and that you understand that there are limitations to what you can do in the time that you are given. Activity 1.9 will help you to consider these issues in more depth.

TIP 1.1

Think about the wider picture as you start to design your project and progress through your research. Keep written or recorded notes as you go. It is useful to refer back to them when you produce your thesis or dissertation. Examiners want to see that you understand the wider picture, know the limitations and are able to suggest ways to improve or expand your work.

Activity 1.9: Matching

Three words to consider when thinking about how research can be expanded, improved, scrutinized or checked are given at the top of the following page, along with three definitions. Match each word with the most appropriate definition. Answers can be found at the end of this chapter.

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Words **Appropriate Definition (See below: 1, 2 or 3)**

Replicate

Repeat

Reproduce

Definitions

- 1 The original researcher follows the same methods and procedures within the same conditions to achieve the same results.
- 2 A different researcher duplicates the results of a study through using the same data and same methods as the original study.
- 3 A different researcher achieves the same (or similar) results using the same methods with new samples (from the original population) and new data.

Pause for thought ...

As you work through this matching activity, you might consider these definitions to be contentious, or you might disagree with them. If so, explain why. (Remember, as a student you should analyse and critique what you are told: if something doesn't seem right to you, question what you are told, develop your own argument and find evidence to back up your argument.) Once you have given your explanation, consult the answers at the end of this chapter to find out more.

WHY DO UNDERGRADUATES HAVE TO DO RESEARCH?

That is a good question. Why do *you* think undergraduates have to do research? Activity 1.10 will help you to think about this in more detail.

Activity 1.10: Reflection

Write down, or make a voice note of, five succinct reasons why you think undergraduates have to (or choose to) do research, then read the answers at the end of this chapter.

1

2

3

4

5

It might help you to get a clearer understanding of the benefits if you consider some practical examples from students studying different subjects. Activity 1.11 will help you to do this.

Activity 1.11: Practical examples

The following examples from undergraduate students help to explain why they were required (or chose) to conduct research. They also illustrate the benefits that can be gained from research and offer advice or tips to other undergraduates.

Rose, chemical engineering

I had to do research for my final assessment to show I was capable. It was fun working in a scientific team. I worked with others who were really enthusiastic and knew what they were doing. Of course, there were problems, but we got them worked out. Doing the research shows I can solve problems and work in a team. Be nice to team members. Help each other. Make friends. You learn so much.

Manaia, ecology

I was well aware of the lack of Indigenous researchers in New Zealand. I chose my course because it really interested me and I knew I'd get the opportunity to do research that'd give a voice to my family and community. We've been overlooked for so long. My grandparents told me the importance of where we come from and how we need to work hard to keep our environment safe. I really wanted to do the research for them. It showed I was able to succeed in a place where there's still not many people like me. If I think about it, it also helped me open other people's eyes to our way of life. I'm not saying it was easy though. You have to straddle two very different lives, especially when you're the first to go to university and experience a different way of learning.

Jeff, nursing (mental health)

I want to work in mental health nursing and doing the research gave me loads of experience. To be fair it was quite daunting to start. Getting to interview people was

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a bit scary. But I got into it. I've learnt how to talk to people I don't know and get them to trust me so they tell me things without feeling uncomfortable. That sort of skill will help me in work. I probably also learnt to organize and plan. So don't feel daunted or scared. My tutor helped – yours will as well.

Jia-Yi, ceramic design

Our whole final year involves research – it's just part of the course and I knew that when I signed up. I developed a project to work collaboratively with a local gallery. They were really keen to get involved. It was a learning curve for me because I can get too taken up with my work and not look at what is going on around me. It's made me become more critically aware of what I do and of visual language and discourse. It's also opened me up to possible professional development opportunities.

Now that you have a better idea of what research is and why it is important, we can move on. However, before we continue to the next chapter, let's test your understanding of what has been covered in this chapter with a short multiple-choice quiz.

SAMPLE

Activity 1.12: Multiple-choice quiz

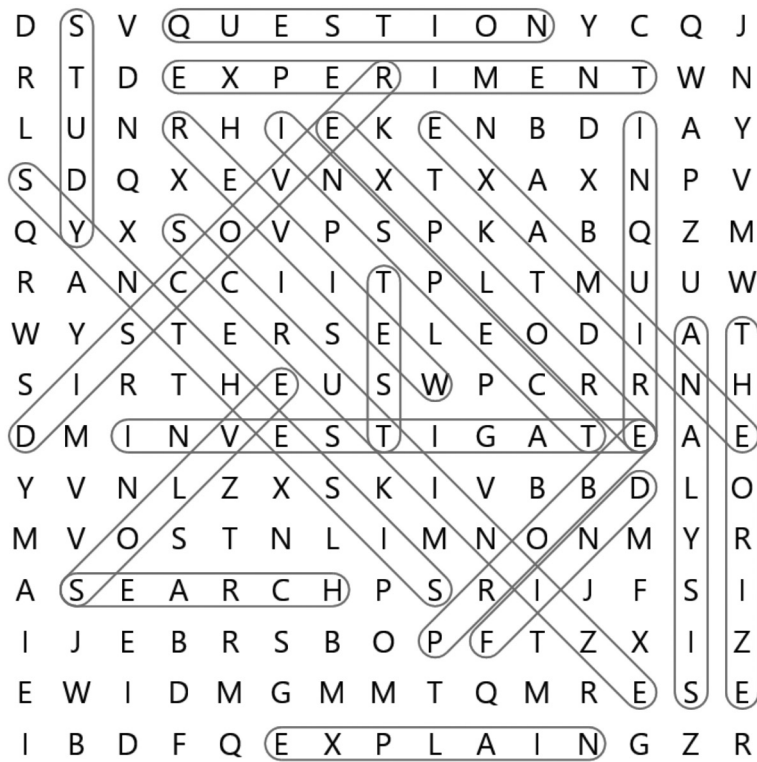
Read each question and choose the correct answer. The topics in all three of these questions have been covered in this chapter, so if you can't answer any of the questions, return to some of the activities to refresh your memory. Answers can be found at the end of the chapter.

- 1 A researcher wants to test their idea that watching advertisements for highly processed food on television leads children to eat more of this type of food. What type of research is this?
 - a Exploratory research.
 - b Theory-testing research.
 - c Descriptive research.
- 2 What is a research question?
 - a An open-ended question used in interviews.
 - b A closed-ended question used on paper questionnaires.
 - c A specific and actionable question around which the research is centred.

- 3 What is 'research integrity'?
 - a The ethical codes that govern and guide all types of research.
 - b The professional standards, codes and practice, along with moral principles, required to conduct research to the highest standards.
 - c Specific standards set by national governments to ensure all research is conducted to the highest standard.

ACTIVITY ANSWERS: CHAPTER 1

Activity 1.2: Word search



Activity 1.3: Missing-word puzzle

Research is an intellectually stimulating process that helps us to answer *questions*, solve *problems*, improve decision-making and tackle many of the issues faced in

the world today. It is an innovative and creative process that enables us to generate, build and advance *knowledge* and ideas.

Research inspires us to work together on a national and *international* basis. It facilitates the cross-fertilization and generation of ideas and encourages us to transfer and *share* skills, techniques, equipment and knowledge.

Research benefits *individuals*, communities, society, industry, the economy and the environment. It enables us to combat disease, increase life expectancy, become more energy efficient and understand how to stop wasting precious resources. Through research we can improve our mental health, understand how people interact and work out what makes us tick. It is a way to combat lies and provide evidence for the *truth*.

Activity 1.4: Checklist (right and wrong answers)

Researchers must identify and declare conflicts of interest: Yes. There are a number of conflicts of interest that can occur at different stages of a research project. Often, they are related to funding and political or financial interests of researchers or grant-awarding bodies. If research is to be trusted and respected, researchers should avoid conflicts of interest. If this is impossible all conflict should be declared in a clear and transparent way.

It is not necessary to declare who has funded a research project: No. All researchers must declare who has funded a research project. This enables others to see that there has been no undue pressure placed on the researcher to carry out research and report in a particular way and that there are no strings attached to the funding.

Researchers should not criticize other science without justification and evidence: Yes. Research builds on research. If researchers find that another project is flawed, they can prove this with evidence. If criticism seems to be unjustified and is not backed up by evidence, there is usually another cause for the criticism, such as political, financial or personal gain.

Researchers should allow their political opinion to influence their research: No. This is a form of bias. All research should endeavour to be free from bias, but if this is not possible, bias should be identified and acknowledged. There are methods and procedures in place that enable researchers to reduce bias in scientific work and they should be understood and followed carefully. If you believe that it is impossible to eliminate bias (we are human) then a careful and systematic account of possible or potential bias should be provided. More information about recognizing and addressing bias when analysing data is provided in Chapter 10.

Media and social media can misrepresent good research: Yes. When this occurs, it can be very frustrating for experienced and conscientious researchers. They can struggle to get their research reported in an unbiased way. As consumers of different types of media, we should ensure that we are sceptical of sensationalist headlines and that we check original sources to verify information.

Research methods made simple

It is important to know the original source of research: Yes. This is related to the point above. Respectable journalists and bloggers should make sure that a link or reference to the original source is provided so that readers and viewers can check the information for themselves.

Researchers must back up statements with evidence. Yes. For research to be respected and trusted, all arguments should be well reasoned and backed up with evidence. This is the case for all academic work you complete as a student.

All research methods must be well documented and clear to see. Yes. Research is seen to be reliable and trustworthy if all documentation of methods and analysis is clear and transparent. It enables others to see how the research was conducted. It also helps others to reproduce or replicate the research at a later date (e.g. to build on the research or to verify original findings).

Researchers should use conjecture when reporting their results: No. Conjecture can be defined as an opinion or stance that has been formed without reference to evidence. It is based on incomplete information. When researchers are reporting their results, they should include all the information required, backed up with evidence. Conjecture has no place in research.

Politicians quote research that goes against their political beliefs: No. Have you ever seen this happen? No, politicians pick and mix research, choosing findings that back up their political beliefs, argument or ideology. On occasions they can misuse statistics in an appalling way, believing that if statistics are complex enough, or if they are convincing in their speech, no one will question them. As researchers it is important that we look out for this type of abuse and set the record straight.

Tabloid newspapers prefer research that has a sensationalist or newsworthy headline: Yes. They most certainly do; after all, their job is to sell newspapers. However, be critical when reading this type of coverage. Research can be misrepresented or reported in a biased way (e.g. to sensationalize or to back up a particular agenda, political view or moral stance). Think about why certain research results have been chosen and others omitted (bias by omission) or why the story has been placed where it has (placement bias).

Research findings should be placed in context: Yes. It is important that all research findings are placed in context, with a clear and accurate description of the circumstances in which the research was conducted. This should include an assessment of what contributed to the success of the project (or led to particular findings) and what hindered the research. This makes it harder for others to use findings inappropriately (e.g. transferring findings to a different setting or country in which the findings are inapplicable).

Researchers should stretch findings to make them a little more publishable: No. It is important that all findings are backed up with appropriate evidence. Sometimes, there is a temptation to stretch positive outcomes, or useful findings, to make them more interesting in the hope that they will be accepted for publication (or help you to pass your course). Researchers might also face pressure from funding bodies to

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talk up the results to give them more significance. Researchers must work with integrity and avoid this type of activity if their work is to be trusted. More information about reporting findings ethically is provided in Chapter 12.

Activity 1.8: Word search



Activity 1.9: Matching

Words	Appropriate definition (1, 2 or 3)
Replicate	3. A different researcher achieves the same (or similar) results using the same methods with new samples (from the original population) and new data.
Repeat	1. The original researcher follows the same methods and procedures within the same conditions to achieve the same results.

Research methods made simple

- Reproduce 2. A different researcher duplicates the results of a study through using the same data and same methods as the original study.

These definitions could be considered contentious when approached from different subjects (e.g. in biology, where an exact copy of a sample that is being analysed is defined as a replicant, or in statistics, where replication is the repetition of an experimental condition).

GO FURTHER 1.3

Detailed information which illustrates how these definitions might differ between disciplines can be obtained from Fidler, F. and Wilcox, J. (2021) 'Reproducibility of scientific results', *The Stanford Encyclopedia of Philosophy* (Summer 2021 Edition), Zalta, E.N (ed.), <https://plato.stanford.edu/archives/sum2021/entries/scientific-reproducibility> [accessed 7 January 2022].

Activity 1.10: Reflection

There are a number of reasons why undergraduates are required to conduct research:

- You are able to pursue a topic that is of personal, community, political and/or cultural interest. This helps to engage and motivate.
- You can contribute to knowledge and build understanding on a particular topic. It enables you to discover something new and make an impact.
- It demonstrates that you are able to think and work independently, plan a project, manage your time, organize your work and complete your project to a specified deadline. These are useful transferable skills that are valued by employers if you are hoping to obtain employment after your studies. More information about the skills that are developed during a research project is provided in Chapter 13.
- Undertaking research provides valuable experience if you want to continue with postgraduate research or pursue a research career. It is useful preparation for doctoral programmes.
- You are able to gain experience in justifying and defending choices, methods and results.
- Outputs in the form of long reports, dissertations or theses enable you to be assessed and illustrate how well you are able to integrate and apply your skills, knowledge and understanding.
- You can gain academic credit for future studies, careers and personal satisfaction.

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- You are able to work together with peers and more experienced researchers, developing abilities to collaborate, cooperate and network, and building friendships that can last a lifetime.
- You can take advantage of university hardware and software, at no cost to yourself, and learn to use materials and equipment effectively, with help and advice from experts.
- Undertaking research provides a sense of purpose and satisfaction, while encouraging personal development and growth.

Activity 1.12: Multiple-choice quiz

- 1 A researcher wants to test their idea that watching advertisements for highly processed food on television leads children to eat more of this type of food. What type of research is this?
 - a Exploratory research.
 - b Theory-testing research (correct answer).
 - c Descriptive research.
- 2 What is a research question?
 - a An open-ended question used in interviews.
 - b A closed-ended question used on paper questionnaires.
 - c A specific and actionable question around which the research is centred (correct answer).
- 3 What is 'research integrity'?
 - a The ethical codes that govern and guide all types of research.
 - b The professional standards, codes and practice, along with moral principles, required to conduct research to the highest standards (correct answer).
 - c Specific standards set by national governments to ensure all research is conducted to the highest standard.