

# Research Skills

## Research skills

### Introduction

All of your College assignments will require you to have good research skills to help you answer questions and develop knowledge of your subject. The advice in this guide is designed to help you develop the research skills you already have and improve upon them. Most people spend time researching every day without even realising it. Every time you use the internet to look something up – song lyrics, football statistics, movie reviews – you are using your research skills.

### So what is research?

Research can be described as searching for information carefully and methodically to find out more about a particular issue and answer questions about it. This can range from very simple tasks, such as using Google to find out when a DVD you want is being released, to the very complex, for instance carrying out a laboratory experiment to measure cortisol levels in the brain. However learning to research effectively and how to move on to the next stage of research is a gradual process. You will be supported by your lecturers to develop the skills you need to research effectively. All research has to begin with a review of the literature and resources which are available on a particular subject. This is called secondary source research because you are making your decisions and collecting information based on research which has been carried out by someone else.

### Getting started

It may seem daunting to start your research when there is so much information available, particularly on the internet. The good news is the College is equipped with a variety of places where you can find that information.

When you first start College, your lecturers will introduce you to the content of your course and this introduction will usually include a reading list. This is a list of the main things you will be expected to read while you are on your course. It will often contain a range of different resources from which you can find information on your course and the content will be strictly relevant to your studies. The Learning Resources team also provide a wide range of resources all of which have been specifically selected to support your College courses.

### Resource types

There are many different formats which you can use for your research, but because your work is expected to be academic there are four main types of resources which are considered to be reliable enough to use in your assignments:



Journals



Books

Ebooks



Websites

## Books

You will almost always be expected to use books when collecting information for your assignments. They are often the most reliable type of resource you can use. The content of a book is very specific, so it is usually easier and quicker to find information than it is using another type of resource. It is sensible to begin research using textbooks as they contain a broad overview of subject content. This will lead you to more specific titles to get a deeper level of understanding.

## Ebooks

Ebooks are quite simply online versions of books. You use them in exactly the same way as a hard copy of a book but they have the added advantage of being online. This means you don't have to carry them around and you can access them anywhere with an internet connection. One of the benefits of ebooks is that the contents page appears alongside the title page, meaning you can just click the chapter title and it will take you directly to the subject you are interested in reading about. This also saves you time when using the index; you can look for a specific subject and type the page number into a box. When you press enter it takes you directly to the page, so you don't have to flick through the entire ebook to look for it. You can also search for specific words and phrases.

## Journals

Journals are published at regular intervals across the year; the period can range from weekly to yearly and the content is peer reviewed. Peer review is a process where experts in a particular subject area look over a range of different articles and research papers to decide which ones are the best. The papers which are selected go into the journal for that particular period. The peer review and periodic publication of journals mean the information contained in them is very recent, unlike books which may not be updated for long periods of time. They contain high-level academic research which means they are an excellent place to find information for your College assignments. However, because of the high level of content, the information contained in a journal might be written in a very academic style. This means it might not be easy to understand. If you find you have looked at a journal and you are not sure about the content, you may need to seek advice. You will write more effectively if you are confident about the information you are using in your assignments

## Websites

There are many useful and informative websites you can use to gather information for your essays. However, because the internet is so vast there is no guarantee of quality from web-based resources. This means the information may not be relevant or reliable; also sifting through the large number of search results you might generate using a search engine can be very time consuming. If you are using a normal search engine such as Google or Bing, then you need to be careful what types of websites you use.

Wikipedia is a great website for finding basic information but wikis can be edited by anyone, meaning the information can be unreliable. This means you can't check for accuracy but they sometimes contain a 'References' section that will take you to the original source which may be more suitable. The same can be said of blogs because they usually contain personal opinion rather than objective research. So how can you assess reliability?

Whilst there is no guarantee of reliability when using internet resources, there are some clues which can help you to assess if a resource is reliable:

- If the URL has the suffix .gov or .org then they are usually government organisations or large companies, so you can be fairly sure of their reliability
- If the resource has come from an educational institution or well-known charitable organisation, such as a university or Oxfam, then the information should be reliable
- You can use websites which are simply dedicated to academic research, such as Google Scholar. This will guarantee the research is high quality and reliable enough to use in your assignments. However, as with journals, the content is often of a very high level so may not always be appropriate
- If you are unsure about the reliability of information on a website, check with Learning Resources staff or your lecturer
- For more information on using the internet, Google Scholar and search engines, please see our IT Skills guide.

## Other resources

The resources listed in the previous section are not exhaustive, but they will be the main types you will use for your assignments. However, it is important to bear in mind the Learning Resources department also have a range of other resources available for you to use. We stock various newspapers but it is important you tend towards using the broadsheets (Guardian, Financial Times etc.) and not the tabloids (The Sun, Daily Mail and so on) in your research. Through MyLearning you can access resources where you can find copyright safe images (JISC Media Hub, SCRAN etc.) and various other online resources, for instance BOB (Box of Broadcasts) which lets you watch TV online. You also have access to reference materials like the Encyclopaedia Britannica. For more information see our User Guide.

## The CRAAP test

By following the guidance on resource types you should be able to find information you can use in your assignments. However, you may still be left with a large number of things to read. The CRAAP test can help you decide which ones you should take the time to read and which ones you should discard. It has five stages, each of which allows you to assess certain things about a piece of research to help you decide if you should use it or not:

**Currency** – this is about the timeliness of the resources, ask yourself:

- When was it published or posted online?
- Has it been revised or updated? Is it the most up-to-date version?
- Does your topic require very current information?

**Relevance** – this is about the importance of the information based on your needs:

- Does the information directly relate to your topic or answer your question?
- Who is the intended audience?
- Is it at an appropriate level? (i.e. not too simple or advanced for your needs)
- Would you feel comfortable using it as an academic resource?

**Authority** – this is about the source of the information:

- Who is the author/publisher/source?
- What is their status? (Are they an academic? Researcher? Lecturer? Minister?)
- Are they qualified to write on that particular topic?

**Accuracy** – this is about how reliable, truthful and correct the content is:

- Where does the information come from?
- Is it backed up with evidence?
- Can you verify any of the information from another source?
- Does the language and tone seem unbiased and free from emotion?
- Are there spelling or grammatical errors?

**Purpose** – this is about the reasons why the information exists:

- Is the information intended to inform, teach, sell, entertain or persuade?
- Does the author make their purpose clear?
- Is the information fact or opinion?
- Does the point of view appear objective?

Although this may seem like a lot of work, once you are practiced at assessing the information it will become second nature to you. After you have performed the CRAAP test, you should have a very clear idea of which resources you need to read. There are various stages you need to go through during your reading, for more information on reading for research see our Study Skills and Learning Styles guide.

By this stage of your research you should have reviewed the literature; this means your secondary source research is complete. You should be ready to either write your assignment or, if you have been asked to, conduct your primary research.

## Research Methods

### Primary research

Primary research is the collection of original data; this means you conduct primary research yourself rather than looking at documents which summarise research conducted by other people. There are various methods which you can use to carry out this type of research. Some of them are quantitative and some of them are qualitative.

Quantitative research methods focus on collecting data which can be analysed using statistics, mathematics or computers. For example, you could carry out a questionnaire into people's shopping habits to find out what percentage of people shop at Tesco.

Qualitative research methods tend to focus on information which can be analysed by observing and interpreting actions. For instance, you may conduct interviews with university students to gain insight into their study behaviours and habits. Before you can consider which methods you will use you need to think about your research design.

## Research design

Research design is the process of planning your research project. This will involve translating the ideas, concepts and theories you find in your reading into a question. From there you should be able to make an assessment of what you think the answer may be and how you are going to go about finding out. This process will take you from a general understanding of a subject area, for example crime in Scotland, to a specific area which you can study, perhaps the effects of domestic violence on women in the Tayside area. Your idea should be intended to do the following things:

### **Explore Describe Explain**

This means you need to look into what is happening, build a picture of it and explain the impact of the idea. So, using the previous example, you may look into statistics on domestic violence in Tayside, explore different issues which may affect it and try to explain the links between those issues and the ways in which women experience them. By this stage in your research design it should be possible for you to come up with a hypothesis.

## Hypothesis

A hypothesis is an explanation for a particular observation or problem which you will attempt to confirm or deny through your research. So if we follow on from the previous example, you might hypothesise that females from low income, Tayside families are more likely to be victims of domestic violence than those from high-income families. You have now devised a question which has specific variables.

A variable is a value which can be measured and accounted for through research. An independent variable is one which is being manipulated or changed to measure the results; in this instance income is an independent variable as it is expected to affect the instances of domestic violence. A dependent variable is the variable which is being tested.

You are looking to see if you can change the value of the dependent variable by manipulating the independent variable. Here, the dependent variable is the number of instances of domestic violence. So if you look at the data from high income families, you would expect the number of instances of domestic violence to be lower than if you studied data from low income families. This is called a causal relationship – one variable is dependent on the other. In order to try and find out whether this statement is true you would have to carry out your experiment. To do this you need to decide which methods to use to collect your data.

## Methodology

The difference between quantitative and qualitative methods has already been outlined (see page 8). So choosing your research methods depends on what you want to find out and how you plan to gain an understanding of your data. Do you want straightforward information which you can break down into numbers? Do you want limited contact with your participants? Do you want to use high numbers of participants to collect your data? If so, you would choose a quantitative method. Or do you want detailed information which you are free to interpret in a variety of ways? Do you want a lot of contact with your participants to build rapport and draw out information? Then you would select a qualitative method.

It is worth noting you can use a combination of the two; this is called triangulation or mixed methods research. The two types of methods, if used carefully, can complement each other – numbers have to be interpreted to understand their meaning and patterns have to be identified to make sense of detailed information! There are a variety of different methods which fall under each category. Remember, whichever method you select you must make sure it is:

**Reliable:** The way you measure information has to be the same for every instance, e.g. you must ask the same question to each interviewee or the laboratory condition must be the same for each attempt at an experiment. This means if the research was repeated by someone else it should produce the same results.

**Valid:** You have to question whether the method you have selected is accurate at measuring your concept. If it is the results you find will create an accurate picture of the concept you are trying to understand.

## Quantitative methods

The methods listed below are the key types you may be expected to use for quantitative analysis (be aware this list is not exhaustive and there are other methods):

**Laboratory experiments:** These will tend to be conducted in a lab to allow a greater level of control over the results that are generated.

**Field experiments:** These are conducted outside of a controlled environment. This means they are conducted in a real-world situation, in the field, and not a laboratory.

**Questionnaires/surveys:** These can be conducted either in person, over the phone, by post or via email. They tend to be made up of short answer, closed questions which can be easily quantified, such as rating scales or yes and no answers. However they can include some open, qualitative questions which require more explanation.

## Qualitative methods

As with the previous section, the most widely used qualitative methods are listed here but the list is not exhaustive so you may come across others:

**Interviews:** These should be somewhat informal in nature. The idea is to generate discussion, not a formal question and answer situation. The questions themselves can be either unstructured, semi-structured or structured dependent on how the interviewer would like the conversation to develop.

**Focus groups:** These are sometimes used in place of, or in addition to, individual interviews. Group interviews are usually made up of 5-10 participants, and the questions can be constructed in any of the ways listed for the individual interviews.

**Observational methods:** This type of research tends to be longer term and the methods can be employed in a few different ways. The researcher can either participate in the activities they are observing (participant observation) or not (non-participant observation). They can also observe overtly, where they disclose their identity as a researcher to the participants, or covertly, where they do not reveal they are a researcher and act as a natural member of the group. However there are ethical issues with the covert method as it involves deception.

## Ethics

Most research has to abide by ethical guidelines to ensure the safety of both the participants and the researcher. If you have any questions about research ethics speak to your lecturer. If your experiment involves people, you must maintain confidentiality by not disclosing their identity in your research and abiding by data protection laws. For more information on data protection see

<https://www.gov.uk/data-protection/the-data-protection-act>

## Carrying out research

Once you have decided on your method there are a number of things to think about before you can conduct your experiment:

- Have you got all the equipment you might need?
- Do you have a suitable space to conduct your research in?
- Do you have all of your written documentation?
- Do you have consent from your lecturer and participants?
- If you need a sample group, how will you select them?

## Sampling

Many research projects require people to participate in them. This may seem obvious but what is less obvious is how you select them. In order to choose your participants you need a sample group, the group should be representative of the section of society you are studying. For example, if you are looking into the general views of the Scottish population you would not select people solely from the 16-24 age group as this does not represent the age distribution of Scotland as a whole. Equally, if you were conducting research into the views of women, you might not want men to participate in your study. However, you will often be restricted by time and location so it may seem easiest to approach your friends or family even though this may not give you the most accurate data. Your results may be biased or skewed in a particular direction.

There are various ways to select your sample from a simple random selection, such as picking names from the phone book, to convenience sampling, selecting participants from the people around you. This can be a difficult part of the research process but it is important you get it right as it will influence the results of your research. It is always best to consult your lecturer when selecting your sample, as they will be able to guide you towards the most appropriate sampling frame for your particular research project.

## Data analysis

Once you have carried out your experiment you will have results which you can analyse. They may be numerical or written, but either way you should be able to interpret your findings to measure whether they support your hypothesis or not.

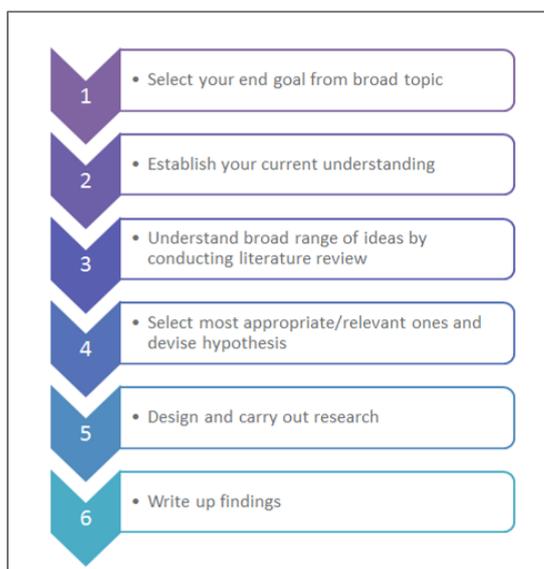
If you carried out quantitative research then you can use mathematical formulas, such as statistics, to transform your raw data into charts and graphs etc. This makes your results easy to interpret so a reader can understand how they impact upon your research.

If you have collected qualitative data, where the emphasis is on the participant's meanings and accounts of their experiences, your approach to analysing data will be different. You will need to categorise your results which requires a more subjective approach. You would have to decide which aspects of your findings are the most important and group them together to look for patterns and significant occurrences—this is called coding. You will also code any quantitative data but it is usually easier to do because of the numerical format. Your chosen variables will provide the basis of your coding and you can then use specialist software, such as SPSS or NVivo, to help with interpreting more complex data. However, you cannot use these programmes without training so your lecturers will usually guide you towards software they want you to use. For more information on data analysis, search for resources on this topic using the library catalogue.

## Write up

Once your data has been analysed you should be ready to write up your research. This may take a variety of formats but will most commonly be a report. Our Writing Guide contains detailed advice and guidance on report writing, but your lecturers will often have a specific format they would like you to use so always ask them first. As with all of your college assignments, your reports should be well presented and written in an academic style.

When writing up your report it is important that you plan carefully how you will detail your findings, as this will keep the flow of writing in your report logical and coherent. There are various stages you will have gone through to reach your end goal when writing your assignment. You will usually begin with a general topic which you are expected to narrow down by reviewing the literature as described earlier in the guide. Once you select the most appropriate topics to study, you are in a position to design and undertake your research and then to write up your findings. It is important that your report, regardless of format, includes information from each of the stages in this research process. This will help your writing to follow a logical order; see the diagram for further guidance.



## Appendix

You may be expected to include some of your raw data in your written report. This is usually a separate section at the end, called an appendix. An appendix or, if there is more than one, appendices are the part of your research where you present the data which you collected. They will contain information which is not essential to explaining your findings but helps to support your analysis. They often contain information which is complex, repetitive or lengthy, such as interview transcripts, charts and statistical analysis. There is no limit to what you can include but it is important to ensure what you do include is strictly relevant to your research. They must, in some way, contribute to answering your research questions or hypothesis.

## A final note

Research skills range from the very simple – looking something up and writing about it – to the very complex – analysing statistical data. Some of them you will already use on a daily basis, but others will be challenging to learn and take time to perfect. The important thing to remember is that research skills are essential to anyone studying, so making sure you understand what is expected of you at College and how to go about doing it is very important. Learning how to research effectively will help you to manage your time and workload more easily. However gaining research skills is a gradual process; so try not to worry about being able to do it all immediately. The advice in this guide should support you in developing your skills but always make sure you consult your lecturers. They will be able to tell you exactly what they want you to achieve from your assignments.

## Top tips

- Be sure that you understand the question you are being asked
- Ask your tutor if there are specific resources you should use and ask for a reading list if there is one available
- Use varied media types to get a better understanding of the subject
- Be sure the source of the information is reliable
- Take time to plan and construct your assignments
- Make notes whichever way is best for you
- Create a mind map of your ideas
- Create a reference list or bibliography as you go (See the Referencing guide for more information)
- Check you have answered the question