**BINGHAM UNIVERSITY LIBRARY, KARU**

**COURSE CODE: GST 121**

**COURSE TITLE: USE OF LIBRARY, STUDY SKILLS & ICT**

**GST 121 Lecture Note**

**BY**

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**Modern technologies in the libraries**

The rate of scientific and technological advancement has greatly increased over the last half century. Nowhere has this been seen than in the area of Information and Communication Technologies (ICT). Therefore, information gathering, processing, storage and retrieval have under gone many procedural changes.

Library being the domain of information gathering, processing, storage and retrieval has been affected greatly by the application of modern technologies in its procedures. Libraries are traditionally known to acquire information, process and store them in their catalogues.

Since libraries are at the center of the information business, it will not remain unchanged when these technologies are changing.

A **database** is a collection of information that is organized so that it can easily be accessed, managed, and updated. In one view, **databases** can be classified according to types of content: bibliographic, full-text, numeric, and images.

**Traditional databases** are organized by fields, records, and files. A field is a single piece of information; a record is one complete set of fields; and a file is a collection of records. For example, a telephone book is analogous to a file.

An **Electronic Database** is a searchable **electronic** collection of resources. A **database** may hold a range of different types of information; journal, book or newspaper articles; journal, book or newspaper citations and abstracts; reports; pictures; and increasingly **e**-books.

**Types of Databases**

What is a database? As you probably know, a database is an organized collection of data used for the purpose of modeling some type of organization or organizational process. It really doesn’t matter whether you’re using paper or a computer software program to collect and store the data. As long as you’re gathering data in some organized manner for a specific purpose, you’ve got a database. Throughout the remainder of this discussion, we’ll assume that you’re using a computer software program to collect and maintain your data. There are two types of databases found in database management, *operational databases* and *analytical databases*. Operational databases are the backbone of many companies, organizations, and institutions throughout the world today. This type of database is primarily used in *on-line transaction processing* (OLTP) scenarios, that is, in situations where there is a need to collect, modify, and maintain data on a daily basis. The type of data stored in an operational database is *dynamic*, meaning that it changes constantly and always reflects up-to-the-minute information. Organizations, such as retail stores, manufacturing companies, hospitals and clinics, and publishing

houses, use operational databases because their data is in a constant state of flux. In contrast, analytical databases are primarily used in *on-line analytical processing* (OLAP) scenarios, where there is a need to store and track historical and time-dependent data. An analytical database is a valuable asset when there is a need to track trends, view statistical data over a long period of time, and make tactical or strategic business projections. This type of database stores *static* data, meaning that the data is never (or very rarely) modified. The information gleaned from an analytical database reflects a point-in-time snapshot of the data. Chemical labs, geological companies, and marketing-analysis firms are examples of organizations that use analytical databases.

**Other Types of Databases**

***Text, graphics and audio information grouped by what they have in common***

Databases provide various formats of information. Different databases provide different kinds of information. In this unit we are focusing on the kinds of databases you use for doing research.

**Bibliographic databases** provide a descriptive record of an item, but the item itself is not provided in the database. Information about the item is provided, including such things as author, title, subject, publisher, etc. The information provided is called a citation. Sometimes a short summary or abstract of the item is provided as well. Examples of bibliographic databases include the GALILEO database Social Sciences Abstracts, or the Internet Movie Database on the World Wide Web.

**A full-text database** provides the full-text of a publication. For instance, Research Library in GALILEO provides not only the citation to a journal article, but often the entire text of the article as well. "CollegeSource Online" offers full-text of 20,000 college catalogs, so rather than having to request a catalog from several colleges to make comparisons, you can gather information from all colleges you're interested in at one time.

Some databases provide **numeric** information, such as statistics or demographic information. Examples of these are (link will open in a pop-up window) [Census Bureau databases](http://factfinder.census.gov/servlet/BasicFactsServlet) and databases containing stock market information.

You can also find databases that collect only **image** information (EBSCOhost image collection), **audio** information (MP3 or wav files), or a **combination** of any of the above types (CNN).

CNN's site has a search option that provides access to news articles and the original video and audio files that accompanied them. Try the link below for a look at the combination of information types in CNN's database.

**Meta-databases** are databases that allow one to search for content that is indexed by other databases. [GOLD](http://www.galileo.usg.edu/express?link=gejl) is an example of this kind of database. If you find a citation for an article in one of the bibliographic databases and want to determine if the article is available in full-text in another database, you could do a search for the journal in GALILEO in Journals A-Z to get a list of all the databases that index that specific publication.

**Search Tools**

The most popular search tools for finding information on the Internet include:

1. Web search engines,
2. Meta search engines,
3. Web directories, and
4. Specialty search services.

* A Web search engine uses software known as a **Web crawler** to follow the hyperlinks connecting the pages on the World Wide Web. The information on these Web pages is indexed and stored by the search engine. To access this information, a user enters keywords in a search form and the search engine queries its algorithms, which take into consideration the location and frequency of keywords on a Web page, along with the quality and number of external hyperlinks pointing at the Web page.
* A Meta search engine enables users to enter a search query once and it runs against multiple search engines simultaneously, creating a list of aggregated search results. Since no single search engine covers the entire web, a Meta search engine can produce a more comprehensive search of the web. Most Meta search engines automatically eliminate duplicate search results. However, meta search engines have a significant limitation because the most popular search engines, such as Google, are not included because of legal restrictions.
* A Web directory organizes subjects in a hierarchical fashion that lets users investigate the breadth of a specific topic and drill down to find relevant links and content. Web directories can be assembled automatically by algorithms or handcrafted. Human-edited Web directories have the distinct advantage of higher quality and reliability, while those produced by algorithms can offer more comprehensive coverage. The scope of Web directories are generally broad, such as DOZ, Yahoo! and The WWW Virtual Library, covering a wide range of subjects, while others focus on specific topics.
* Specialty search tools enable users to find information that conventional search engines and meta search engines cannot access because the content is stored in databases. In fact, the vast majority of information on the web is stored in databases that require users to go to a specific site and access it through a search form. Often, the content is generated dynamically. As a consequence, Web crawlers are unable to index this information. In a sense, this content is "hidden" from search engines, leading to the term invisible or deep Web. Specialty search tools have evolved to provide users with the means to quickly and easily find deep Web content. These specialty tools rely on advanced bot and intelligent agent technologies to search the deep Web and automatically generate specialty Web directories, such as the Virtual Private Library.

**Open access** (**OA**) refers to online [research](https://en.wikipedia.org/wiki/Research) outputs that are free of all restrictions on access (e.g., access tolls) and free of many restrictions on use (e.g. certain copyright and license restrictions). Open access can be applied to all forms of published research output, including [peer-reviewed](https://en.wikipedia.org/wiki/Peer-reviewed) and non-peer-reviewed [academic journal](https://en.wikipedia.org/wiki/Academic_journal) articles, [conference papers](https://en.wikipedia.org/wiki/Conference_papers), [theses](https://en.wikipedia.org/wiki/Theses), book chapters, and [monographs](https://en.wikipedia.org/wiki/Monograph).

[Two degrees](https://en.wikipedia.org/wiki/Gratis_versus_libre) of open access can be distinguished: *gratis* open access, which is online access free of charge, and *libre* open access, which is online access free of charge plus various additional usage rights.[[6]](https://en.wikipedia.org/wiki/Open_access#cite_note-Gratis_and_Libre_Open_Access-6) These additional usage rights are often granted through the use of various specific [Creative Commons licenses](https://en.wikipedia.org/wiki/Creative_Commons_license). Libre open access is equivalent to the definition of open access in the [Budapest Open Access Initiative](https://en.wikipedia.org/wiki/Budapest_Open_Access_Initiative) and the [Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities](https://en.wikipedia.org/wiki/Berlin_Declaration_on_Open_Access_to_Knowledge_in_the_Sciences_and_Humanities).

There are multiple ways authors can provide open access to their work. One way is to publish it and then [self-archive](https://en.wikipedia.org/wiki/Self-archive) it in a [repository](https://en.wikipedia.org/wiki/Digital_repository) where it can be accessed for free, such as their [institutional repository](https://en.wikipedia.org/wiki/Institutional_repository),[[10]](https://en.wikipedia.org/wiki/Open_access#cite_note-roar-10)[[11]](https://en.wikipedia.org/wiki/Open_access#cite_note-DemystifyingOpenAccess-11) or a central repository such as [PubMed Central](https://en.wikipedia.org/wiki/PubMed_Central). This is known as 'green' open access. Some publishers require delays, or an [embargo](https://en.wikipedia.org/wiki/Embargo_(academic_publishing)), on when a research output in a repository may be made open access. Several initiatives provide an alternative to the American and English language dominance of existing publication indexing systems, including [Index Copernicus](https://en.wikipedia.org/wiki/Index_Copernicus), [SciELO](https://en.wikipedia.org/wiki/SciELO" \o "SciELO) and [Redalyc](https://en.wikipedia.org/wiki/Redalyc" \o "Redalyc).

A second way authors can make their work open access is by publishing it in such a way that makes their research output immediately available from the publisher.[[13]](https://en.wikipedia.org/wiki/Open_access#cite_note-linkinghub.elsevier.com-13) This is known as 'gold' open access,[[14]](https://en.wikipedia.org/wiki/Open_access#cite_note-14) and within the sciences this often takes the form of publishing an article in either an [open access journal](https://en.wikipedia.org/wiki/Open_access_journal),[[15]](https://en.wikipedia.org/wiki/Open_access#cite_note-doaj-15) or a [hybrid open access journal](https://en.wikipedia.org/wiki/Hybrid_open_access_journal). The latter is a journal whose business model is at least partially based on subscriptions, and only provide Gold open access for those individual articles for which their authors (or their author's institution or funder) pay a specific fee for publication, often referred to as an [Article Processing Charge](https://en.wikipedia.org/wiki/Article_Processing_Charge).[[16]](https://en.wikipedia.org/wiki/Open_access#cite_note-Suber2012-16) Pure open access journals do not charge subscription fees, and may have one of a variety of business models. Many, however, do charge an article processing fee.

Widespread public access to the [World Wide Web](https://en.wikipedia.org/wiki/World_Wide_Web) in the late 1990s and early 2000s fueled the open access movement, and prompted both the green open access self-archiving of non-open access journal articles and the creation of gold open access journals. Conventional non-open access journals cover publishing costs through [access tolls](https://en.wikipedia.org/wiki/Subscription_business_model) such as subscriptions, site licenses or pay-per-view. Some non-open access journals provide open access after an [embargo](https://en.wikipedia.org/wiki/Embargo_(academic_publishing)) period of 6–12 months or longer (see [delayed open access journals](https://en.wikipedia.org/wiki/Delayed_open-access_journal)).[[16]](https://en.wikipedia.org/wiki/Open_access#cite_note-Suber2012-16) Active debate over the economics and reliability of various ways of providing open access continues among researchers, academics, librarians, university administrators, funding agencies, government officials, commercial [publishers](https://en.wikipedia.org/wiki/Publisher), editorial staff and [society](https://en.wikipedia.org/wiki/Learned_society) publishers.

**Open-access (OA)** literature is digital, online, free of charge, and free of most copyright and licensing restrictions. What makes it possible is the internet and the consent of the author or copyright-holder.

**OA** is entirely compatible with peer review, and all the major OA initiatives for scientific and scholarly literature insist on its importance. Just as authors of journal articles donate their labor, so do most journal editors and referees participating in peer review.

**OA** literature is not free to produce, even if it is less expensive to produce than conventionally published literature. The question is not whether scholarly literature can be made costless, but whether there are better ways to pay the bills than by charging readers and creating access barriers. Business models for paying the bills depend on how OA is delivered.

**Open Courseware** (**OCW**) are [course](https://en.wikipedia.org/wiki/Course_(education)) lessons created at universities and published for free via the [Internet](https://en.wikipedia.org/wiki/Internet). OCW projects first appeared in the late 1990s, and after gaining traction in Europe and then the United States have become a worldwide means of delivering educational content.

**MIT Open Courseware (MIT OCW)** is an initiative of the [Massachusetts Institute of Technology](https://en.wikipedia.org/wiki/Massachusetts_Institute_of_Technology) (MIT) to put all of the educational materials from its [undergraduate](https://en.wikipedia.org/wiki/Post-secondary_education)- and [graduate-level](https://en.wikipedia.org/wiki/Quaternary_education) courses [online](https://en.wikipedia.org/wiki/Online), partly [free](https://en.wikipedia.org/wiki/Free_content) and [openly available](https://en.wikipedia.org/wiki/Open_access_(publishing)) to anyone, anywhere. MIT Open Courseware is a large-scale, [web-based](https://en.wikipedia.org/wiki/Website) publication of MIT course materials. The project was announced in [October 2002](https://web.archive.org/web/20021014163054/ocw.mit.edu/index.html) at the [Way back Machine](https://en.wikipedia.org/wiki/Wayback_Machine) (archived October 14, 2002) and uses [Creative Commons](https://en.wikipedia.org/wiki/Creative_Commons_licenses) Attribution-Noncommercial-Share Alike license. The program was originally funded by the [William and Flora Hewlett Foundation](https://en.wikipedia.org/wiki/William_and_Flora_Hewlett_Foundation), the [Andrew W. Mellon Foundation](https://en.wikipedia.org/wiki/Andrew_W._Mellon_Foundation), and MIT. Currently, MIT Open Courseware is supported by MIT, corporate underwriting, major gifts, and donations from site visitors.[[1]](https://en.wikipedia.org/wiki/MIT_OpenCourseWare#cite_note-why-donate-1) The initiative has inspired more than 250 other institutions to make their course materials available as [open educational resources](https://en.wikipedia.org/wiki/Open_educational_resources) through [the Open Courseware Consortium](http://www.oeconsortium.org/).[[2]](https://en.wikipedia.org/wiki/MIT_OpenCourseWare#cite_note-2)

As of October 2012, over 2180 courses were available online. While a few of these were limited to chronological reading lists and discussion topics, a majority provided homework problems and exams (often with solutions) and lecture notes. Some courses also included interactive web demonstrations in [Java](https://en.wikipedia.org/wiki/Java_(programming_language)), complete textbooks written by MIT professors, and [streaming](https://en.wikipedia.org/wiki/Streaming_media) video lectures.

As of October 2012, 60 courses included complete video lectures. The videos were available in streaming mode, but could also be downloaded for viewing offline. All video and audio files were also available from [iTunes U](https://en.wikipedia.org/wiki/ITunes_U) and the [Internet Archive](https://en.wikipedia.org/wiki/Internet_Archive).

## Principles

According to the website of the OCW Consortium, an OCW project:

* Is a free and open digital publication of high quality educational materials, organized as courses.
* Is available for use and adaptation under an open license, such as certain [Creative Commons](https://en.wikipedia.org/wiki/Creative_Commons) licenses.
* Does not typically provide certification or access to faculty.

**Evaluating Information Resources**

Evaluating information sources is a important part of the research process. Not all information is reliable or true, nor will all information be suitable for your paper or project. Print and Internet sources vary widely in their authority, accuracy, objectivity, currency, and coverage. Users must be able to critically evaluate the appropriateness of all types of information sources prior to relying on the information.

The Internet is a wonderful avenue to explore for information. However, since anyone can publish on the Internet you want to ensure that the information you are getting is accurate and reliable. Unlike most print sources such as books and journals where a lot of filtering takes place -- peer review or editing, for example, the information you're getting from a majority of Internet resources is unfiltered. This guide provides a starting point for evaluating websites and other Internet information.

The Internet, particularly its biggest component, the World Wide Web, has surpassed most libraries in the **quantity** of information it makes available. However, the Web has not surpassed libraries in the overall **quality** of information it makes available. Traditionally, a main component of library collections have been print (paper) materials. Today, however, many online resources are being added to supplement collections, replace printed (paper) items, or improve access. Although online sources are accessible via the Internet or Web, most originated in paper form and follow the same publication criteria. Therefore the quality of print and online information sources are similar and will be considered the same in this discussion. A look at a few characteristics of print and Internet sources will identify major **quality** distinctions between print and Internet information sources.

**Print Sources vs. World Wide Web**

**Print Sources**

* Quality standards of printed materials are controlled through a system of checks and balances imposed by peer review, editors, publishers, and librarians, all of whom manage and control access to printed information. This assures that published materials have been through some form of critical review and evaluation, preventing informal, poorly designed, difficult-to-use and otherwise problematic materials from ever getting into the hands of users.
* In academic and other research libraries, most books and periodicals are a product of the [scholarly communication system](http://library.uaf.edu/ls101-scholarly-communication). This system ensures that authors present information in an orderly and logical manner appropriate to the topic.
* Printed information in books and periodicals follows established linear formats for logical and effective organization.
* Materials in printed form are stable. Once in print, information remains fixed for all time. New editions and revisions often are published, but these are separate and distinct physical entities that can be placed side by side with the originals.

**World Wide Web**

* On the web, anyone can, with no supervision or review at all, put up a web page.
* On the Web, there is nonsystematic monitoring of much of what appears, except, of course, for articles published in the online forms of otherwise reputable scholarly journals and books. Biases, hidden agendas, distorted perspectives, commercial promotions, inaccuracies, and so on are not monitored.
* There is no standard format for Web sites and documents. Web pages exhibit fewer clues regarding their origins and authoritativeness than print sources. Important information, such as dates, author(s), references and alike are not always easy to locate. While a reader can easily note this information in a book or periodical article, the Web user must often search through several pages, if the information is provided at all.
* Internet sources are also not stable. Web documents can be changed easily. And once changed, the original is gone forever unless a specific effort is made to preserve it. In fact, many Web documents are intentionally designed to change as necessary, and with automatic changes as with manual changes, the original disappears.
* Web resources use hypertext links and need not be organized in any linear fashion. One can easily be led astray and distracted from the topic at hand. But, of course, one can also be led to additional information of value.
* The changing nature of the Web and Web documents create major problems with the stability of information and with links between different units of information. Dead or broken and links on the Web are common and others just disappear or are not updated.

For print sources, quality control is sought through critical evaluation during the publication process. However, on the Web, anyone with access to the Internet can publish. Web pages are easy to create with little or no training. And there is no overriding organization or governing body ensuring the validity of Web page content. There is a good deal of high-quality information on the Web, but there is also much that is of questionable quality. Do not assume that information on the Web is more current or accurate. Each web page will have to be examined critically.

It is the user's responsibility to evaluate information sources, in print and on the Web that they find during the research process before using it in a paper or other presentation.

**Five Criteria for Evaluating Resources: AAOCC**

For this brief introduction to evaluating resources in LS101, we will use a list of five critical criteria. You might want to remember **AAOCC** (**A**uthority, **A**ccuracy, **O**bjectivity, **C**urrency, and **C**overage), if for no other reason than you might be asked to list these criteria and describe them briefly. The same basic questions should be asked of **all** information sources: books, journal articles, web pages, blogs, videos, sound recordings and e-books.

1. **Authority**
   * Who is the author or creator (who is responsible for the intellectual content) and what are his or her credentials? Is there any indication of the author's education, other publications, professional affiliations or experience in the topic written about?
   * Is there a note or paragraph in the back of the book or on the jacket (cover, jewel case, or supplementary brochure) describing the author's credentials?
   * Is the author's e-mail address, postal address or phone number provided?
   * Has the author been cited in other bibliographies?
   * Sometimes information about an author is available in sources other than the document at hand. Instructors assigning research topics might focus on a particular author. Many authors can be looked up in such resources as:
     + *Who's Who in America*
     + *Current Biography*
     + *The International Who's Who*
     + *Who's Who in Science and Engineering*
     + *American Men & Women of Science*
     + *Who's Who in the World*
     + *Dictionary of Scientific Biography*
     + Look for additional information in directories of Professional Associations or *Biography Index* (FirstSearch)

Noted resources are accessible via the [Databases by Title](http://library.uaf.edu/databases-by-title) page.

For Web Sites:

* + Be sure to distinguish between the author of the information and, if separate, the Webmaster who put it up.
  + In the case of Web material provided by committees, organizations, businesses, or government agencies (rather than individuals), similar questions concerning the authority of these bodies need to be asked. Be sure to consider whether information provided by corporate bodies is likely to be objective, factual and carefully researched or whether it is biased toward the particular objectives of those bodies or the causes, movements or agendas they support.
  + Analysis of the URL provides some indication of identity of the web site sponsor.
  + Look for an "about us" or "FAQ" (frequently asked questions) page.

1. **Accuracy/Quality**
   * Is the information provided specific?
   * For research on any topic dealing with things and events in the real world, accuracy is, obviously, of highest importance. Data and information must be based on observations, measurements, analyses, interpretations and conclusions agreeable to intelligent and relatively unbiased human beings. In the arts, humanities and religion where imagination is the primary creative force, accuracy is still important in recording names, dates and places that creative works, ideas, and opinions originated from.
   * In all cases, with all information materials, accuracy appropriate to the topic at hand should be **verifiable**, whether in the nature of the presentation, with available supporting documentation, or both. Are conclusions based on research or actual figures that can be checked in other sources?
   * Are methods of research explained in such a way that it could reproduced?
   * Are sources of information listed in foot/end notes, bibliographies, or lists of references? How reliable are the cited sources?
   * Are critical reviews available (for books, films, literature, music, art)? Check resources such as:
     + Book Review Index
     + FirstSearch (*Book Review Digest*, *Humanities Index*, *Social Sciences Index*, *MLA Bibliography*, *Reader's Guide to Periodical Literature*, etc.)
     + Academic Search Premiere
     + Gales Literature Resource Center

Noted resources are accessible via the [Databases by Title](http://library.uaf.edu/databases-by-title) page.

* + Does the article appear in a scholarly journal, peer-reviewed or refereed? The type of source can often be identified by its format. Review the tips for identifying [Scholarly vs. Popular Periodicals](http://library.uaf.edu/ls101-scholarly-vs-popular).

For Web Sites:

* + High-quality writing, including good format, grammar, spelling and punctuation, can enhance the appearance of accuracy and bolster a reader's confidence in the accuracy and reliability of a Web document.

1. **Objectivity**
   * Authors often have their own agendas, whether to sell products, influence legislation or capture converts. There probably is no absolute objectivity upon which everyone could agree. When using any information resource, you must decide whether the information is sufficiently objective for the topic and purpose at hand or whether it is biased. Of course a highly biased presentation can be considered in objective scholarly research as long as that bias is described and weighed against alternative views or interpretations.
   * Is there any advertising (including solicitations for donations) associated with the source?
   * Does the author provide more than one point of view?
   * Does the writing use inflammatory or biased language?
2. **Currency**
   * Currency is especially important in the sciences where new developments occur frequently.
   * In the arts and humanities, currency needs to be judged as appropriate. In some cases, a study written years ago may be essential to understanding.
   * Consider whether or not the timeliness of the information will affect its usefulness.
   * In all cases, there should be some indication of the date of the material. If research results are given, consider not only the date of the publication but also when the research was actually conducted.

For Web Sites:

* + Obviously it is important for information found on the Web to be up-to-date. However, its appearance on the Web is not a guarantee it is.
  + There should be some indication of the date of the material, as in the "last updated" statement at the end of many Web documents. Be aware that the "Last updated" date of the web page may differ from date of the intellectual content of the page. This may mean checking three dates, the date the page was last updated or posted to the web, the date of publication, and the date of the research or statistics used.

1. **Coverage**
   * Decide whether the information source adequately covers the topic. It is too easy to go with one or two documents that seem otherwise to be of value but which really cover the topic only partly or marginally. Unless one has already a good sense for the breadth of a topic, one should invest a little more effort toward assuring the material at hand adequately covers it.
   * Consider how coverage from one source compares with coverage by other sources.
   * Look for a statement describing the purpose or coverage of the source and consider if the information is in-depth enough for your needs.
   * Does the information source leave questions unanswered (ask the "five W's and H" to check: who, what, when, where, why and how)?

# **STUDY SKILLS**

**Study skills** or *study strategies* are approaches applied to learning. They are generally critical to success in school,[[1]](https://en.wikipedia.org/wiki/Study_skills" \l "cite_note-eric1-1) considered essential for acquiring good grades, and useful for learning throughout one's life. Respicius Rwehumbiza in his book "Understanding Examination Techniques and Effective study Strategies" in 2013 asserted that, most students fail in examinations simply because they lack study skills and/or examination taking techniques.

Study skills are an array of skills which tackle the process of organizing and taking in new information, retaining information, or dealing with [assessments](https://en.wikipedia.org/wiki/Exam). They include [mnemonics](https://en.wikipedia.org/wiki/Mnemonic), which aid the retention of lists of information; effective reading; concentration techniques;[[2]](https://en.wikipedia.org/wiki/Study_skills" \l "cite_note-2) and efficient [notetaking](https://en.wikipedia.org/wiki/Note-taking" \o "Note-taking).

While often left up to the student and their support network, study skills are increasingly taught in [high school](https://en.wikipedia.org/wiki/High_school) and at the [university](https://en.wikipedia.org/wiki/University) level. A number of books and websites are available, from works on specific techniques such as [Tony Buzan](https://en.wikipedia.org/wiki/Tony_Buzan)'s books on [mind-mapping](https://en.wikipedia.org/wiki/Mind_map), to general guides to successful study such as those by [Stella Cottrell](https://en.wikipedia.org/wiki/Stella_Cottrell) and Understanding Examination Techniques and Effective study Strategies by Respicius Rwehumbiza.

More broadly, any skill which boosts a person's ability to study and pass exams can be termed a study skill, and this could include [time management](https://en.wikipedia.org/wiki/Time_management) and motivational techniques.

Study skills are discrete techniques that can be learned, usually in a short time, and applied to all or most fields of study. They must therefore be distinguished from strategies that are specific to a particular field of study e.g. music or technology, and from abilities inherent in the student, such as aspects of intelligence or [learning styles](https://en.wikipedia.org/wiki/Learning_styles).

# **Types**

### Rehearsal and rote learning

Memorization is the process of committing something to memory. The act of memorization is often a deliberate mental process undertaken in order to store in memory for later recall items such as experiences, names, appointments, addresses, telephone numbers, lists, stories, poems, pictures, maps, diagrams, facts, music or other visual, auditory, or tactical information. Memorization may also refer to the process of storing particular data into the memory of a device. One of the most basic approaches to learning any information is simply to repeat it by rote. Typically this will include reading over notes or a textbook, and re-writing notes.

### Reading and listening

The weakness with rote learning is that it implies a passive reading or listening style. Educators such as [John Dewey](https://en.wikipedia.org/wiki/John_Dewey) have argued that students need to learn [critical thinking](https://en.wikipedia.org/wiki/Critical_thinking) - questioning and weighing up evidence as they learn. This can be done during lectures or when reading books.

One method used to focus on key information when studying from books is the **PQRST method**. This method prioritizes the information in a way that relates directly to how they will be asked to use that information in an exam. PQRST is an acronym for **P**review, **Q**uestion,Read, **S**ummary, **T**est.

1. **Preview:** The student looks at the topic to be learned by glancing over the major headings or the points in the syllabus.
2. **Question:** The student formulates questions to be answered following a thorough examination of the topic(s).
3. **Read:** The student reads through the related material, focusing on the information that best relates to the questions formulated earlier.
4. **Summary:** The student summarizes the topic, bringing his or her own understanding into the process. This may include written notes, spider diagrams, flow diagrams, labeled diagrams, [mnemonics](https://en.wikipedia.org/wiki/Mnemonics), or even voice recordings.
5. **Test:** The student answers the questions drafted earlier, avoiding adding any questions that might distract or change the subject.

There are a variety of studies from different colleges nationwide that show peer-communication can help increase better study habits tremendously. One study shows that an average of 73% score increase was recorded by those who were enrolled in the classes surveyed.

### [Flashcard](https://en.wikipedia.org/wiki/Flashcard) training

**Flash Cards** are visual cues on cards. These have numerous uses in teaching and learning, but can be used for revision. Students often make their own flash cards, or more detailed **index cards** - cards designed for filing, often A5 size, on which short summaries are written. Being discrete and separate, they have the advantage of allowing students to re-order them, pick a selection to read over, or choose randomly for self-testing.

### [Keywords](https://en.wikipedia.org/wiki/Index_term)

Summary methods vary depending on the topic, but most involve condensing the large amount of information from a course or book into shorter notes. Often these notes are then condensed further into key facts.

**Organized summaries:** Such as [outlines](https://en.wikipedia.org/wiki/Outline_(list)) showing keywords and definitions and relations, usually in a [tree structure](https://en.wikipedia.org/wiki/Tree_structure).

**Spider diagrams:** Using [spider diagrams](https://en.wikipedia.org/wiki/Spider_diagram) or [mind maps](https://en.wikipedia.org/wiki/Mind_map) can be an effective way of linking concepts together. They can be useful for planning essays and essay responses in exams. These tools can give a visual summary of a topic that preserves its logical structure, with lines used to show how different parts link together.

### [Visual imagery](https://en.wikipedia.org/wiki/Mental_image)

Some learners are thought to have a visual [learning style](https://en.wikipedia.org/wiki/Learning_style), and will benefit greatly from taking information from their studies which are often heavily verbal, and using visual techniques to help encode and retain it in memory.

Some memory techniques make use of visual memory, for example the [method of loci](https://en.wikipedia.org/wiki/Method_of_loci), a system of visualizing key information in real physical locations e.g. around a room.

**Diagrams** are often underrated tools. They can be used to bring all the information together and provide practice reorganizing what has been learned in order to produce something practical and useful. They can also aid the recall of information learned very quickly, particularly if the student made the diagram while studying the information. Pictures can then be transferred to [flash cards](https://en.wikipedia.org/wiki/Flashcard) that are very effective last-minute revision tools rather than rereading any written material.

### [Acronyms](https://en.wikipedia.org/wiki/Acronyms) and [mnemonics](https://en.wikipedia.org/wiki/Mnemonic)

A **mnemonic** is a method of organizing and memorizing information. Some use a simple phrase or fact as a trigger for a longer list of information. For example, the cardinal points of the [compass](https://en.wikipedia.org/wiki/Compass) can be recalled in the correct order with the phrase "**N**ever **E**at **S**hredded **W**heat". Starting with **North**, the first letter of each word relates to a compass point in clockwise order round a compass.

### [Exam](https://en.wikipedia.org/wiki/Exam) strategies

The **Black-Red-Green method** (developed through the Royal Literary Fund) helps the student to ensure that every aspect of the question posed has been considered, both in exams and essays .[[11]](https://en.wikipedia.org/wiki/Study_skills" \l "cite_note-11) The student underlines relevant parts of the question using three separate colors (or some equivalent). **BLA**ck denotes '**BLA**tant instructions', i.e. something that clearly must be done; a directive or obvious instruction. **RE**d is a **RE**ference Point or **RE**quired input of some kind, usually to do with definitions, terms, cited authors, theory, etc. (either explicitly referred to or strongly implied). **GRE**en denotes **GRE**mlins, which are subtle signals one might easily miss, or a ‘**GRE**EN Light’ that gives a hint on how to proceed, or where to place the emphasis in answers [[1]](http://www.rlf.org.uk/fellowshipscheme/writing/documents/answerquestionb.pdf). Another popular method whilst studying is to P.E.E; Point, evidence and explain, reason being, this helps the student break down exam questions allowing them to maximize their marks/grade during the exam. Many Schools will encourage practicing the P.E.Eing method prior to an exam.

### [Time management](https://en.wikipedia.org/wiki/Time_management), organization and lifestyle changes

Often, improvements to the effectiveness of study may be achieved through changes to things unrelated to the study material itself, such as time-management, boosting motivation and avoiding [procrastination](https://en.wikipedia.org/wiki/Procrastination), and in improvements to [sleep](https://en.wikipedia.org/wiki/Sleep) and [diet](https://en.wikipedia.org/wiki/Diet_(nutrition)).

Time management in study sessions aims to ensure that activities that achieve the greatest benefit are given the greatest focus. A **traffic lights** system is a simple way of identifying the importance of information, highlighting or underlining information in colours:

* Green: topics to be studied first; important and also simple
* Amber: topics to be studied next; important but time-consuming
* Red: lowest priority; complex and not vital.

This reminds students to start with the things which will provide the quickest benefit, while 'red' topics are only dealt with if time allows. The concept is similar to the [ABC analysis](https://en.wikipedia.org/wiki/ABC_analysis), commonly used by workers to help prioritise. Also, some websites (such as [FlashNotes](https://en.wikipedia.org/wiki/FlashNotes" \o "FlashNotes)) can be used for additional study materials and may help improve time management and increase motivation.

In addition to time management, sleep is an important lifestyle change that could affect your studying. Sleeping less means that you have more time to study. This is a true fact, but just because you are “studying,” does not necessarily mean that your brain is processing everything that you are trying to learn or memorize. It is a proven fact that sleeping more can help you study better, because your brain can process more facts when it has had the rest it needs every night.