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Interdisciplinary Alphabet

A to Z of academic terms with multiple meanings and uses

Introduction

The alphabet that follows is a collection of words and terms that illustrate two dimensions of interdisciplinary research. Many of the words are demonstrative of the multiplicity of definitions that can, in some cases, lead to misunderstandings when working in an interdisciplinary team. Other words are commonly used in relation to interdisciplinary work, and so are useful to have in mind when considering a project idea. It is not an exhaustive list, and nor are the definitions either complete or definitive.

Each entry in this alphabet is headed by the Oxford English Dictionary definitions and, when relevant, descriptions from research bodies like REF and UKRI. Below this is either a short description of how the term relates to interdisciplinary research, or a list of discipline-specific definitions, with the disciplinary area highlighted in italics. In cases where the OED definition covers disciplinary uses of the word, this is not always expanded upon; in general the alphabet is a guide to words that have uses beyond the most commonly used meanings.

The purpose of this alphabet is to provide a starting point, either for individual consideration or group discussion, for conversations about terms being used and their meanings within a project.

INTERDISCIPLINARY ALPHABET

Interdisciplinary

OED: Of or pertaining to two or more disciplines or branches of learning; contributing to or benefiting from two or more disciplines.

REF (2021): "Interdisciplinary research is understood to achieve outcomes (including new approaches) that could not be achieved within the framework of a single discipline. Interdisciplinary research features significant interaction between two or more disciplines and / or moves beyond established disciplinary foundations in applying or integrating research approaches from other disciplines".

Multidisciplinary

OED: Combining or involving several separate disciplines.

Transdisciplinary

OED: Of or pertaining to more than one discipline or branch of learning; interdisciplinary.

Interdisciplinary research is an umbrella term for projects involving researchers from multiple academic fields, working collaboratively across disciplinary divisions.

This collaborative research is also sometimes described as multi- or trans-disciplinary, according to the degree of integration involved. Multi-disciplinary research combines different methods, but researchers work within their own disciplines and then bring their findings together to collaborate. Interdisciplinary research combines research methods from multiple disciplines more closely. Transdisciplinary research, according to some interpretations, goes a step further than the integration involved in interdisciplinary research to generate new methods. According to others, transdisciplinary research reaches outside of academia to involve non-HE partners, for example charities and NGOs. Interdisciplinary is the term most frequently used, especially by funding bodies.

To offer an analogy: multidisciplinary research is like a fruit bowl, with the fruits together but separate; interdisciplinary research is on a spectrum from fruit salad to smoothie, with the fruits combined to a greater or lesser degree. Where transdisciplinary fits in this analogy is dependent on the definition being used – it could be a hybrid fruit, or it could be a smoothie bowl, adding grains and other ingredients to the fruit mix.

rtefact

OED: An object made or modified by human workmanship, as opposed to one formed by natural processes.

In ***archaeology***, an artefact is an excavated man-made item, such as a pot or a coin.

In ***science***, an artefact is a false result from an experiment, in particular a false result caused by the experimental process.

In ***natural science*** and ***signal processing***, an artefact is an error caused by equipment or methods, such as an anomaly in medical imaging.

In ***cellular biology***, an artefact is something present in tissue after death that is not present in living tissue, caused by death-related chemical processes.

ias

OED: A tendency, inclination, or leaning towards a particular characteristic, behaviour, etc.; tendency to favour or dislike a person or thing, especially as a result of a preconceived opinion; partiality, prejudice. Also: an instance of this; a physical inclination in a specified direction; a tendency to lean, turn, etc. to one side.

In the ***humanities***, bias can refer to both the sources being studied and the author studying them. In both cases, the preconceived opinions within a text are taken into account when studying them.

In ***statistical*** use, bias occurs when the sampling method used leads to distorted results. This meaning is seen in ***social sciences*** and in ***medical research*** (especially as relates to who is included in a study or trial).

In ***mechanics***, bias is a tendency to move in a certain direction or and is built into a structure.

In ***electronics***, bias is that parameter set in order to establish a threshold for a device, and the threshold itself. Also: ‘an offset in the reading or output of a sensor or elec. device’.

In ***popular culture***, especially K-pop and other South Korean entertainment, ‘bias’ indicates a person’s favourite pop group, member of a pop group, or actor.

INTERDISCIPLINARY ALPHABET

luster

OED: A collection of things of the same kind; a number of persons, animals, or things gathered or situated close together.

In ***astronomy***, a cluster is a group of stars which appear as a nebula to the naked eye, but are in fact faint stars in a dense mass.

In ***linguistics***, a cluster is ‘group of successive consonants.’

Cluster also appears in compound nouns to indicate that said noun is present as a close group, e.g. types of fruit or cluster headaches.

Code

OED: I: A collection of laws, rules, writings, etc.;
II: A system of signs or symbols;
III: An individual sign or symbol.

In ***linguistics***, a code is a language or a dialect. Code-switching is used to describe someone changing which dialect they use according to context.

In ***computing***, a code is a system for offering instructions to or inputting information into a computer.

Something written ‘in code’ can mean it is written in such a way as to obscure the meaning, e.g., exchanging letters and numbers, or substituting one word for another. To ‘decode’ something is therefore to translate the text out of said code, to reveal the meaning.

ritical

OED: I: with reference to a crisis or decisive point;
II: with reference to criticism.

In general use, critical is either a synonym for important or significant, and is used to describe passing (usually negative) judgement on something or someone.

In ***medicine***, critical is used to describe a person who is extremely ill or at risk of death, and to describe a day or moment that is important to treatment outcomes, such as when a clear 'change for better or worse' is expected.

In ***maths*** and ***physics***, a critical point is a 'point of transition from one state to another.'

In ***nuclear physics***, a nuclear reactor in which a chain reaction is being sustained is considered critical.

In ***humanities***, critical work analyses or evaluates texts or other sources.

In ***philosophy***, critical describes approaches 'founded on the criticism of knowledge.'

Culture

OED: I: the cultivation of land, and derived senses;
III: the arts and other manifestations of human intellectual achievement regarded collectively.

In ***social sciences*** and in common use, culture is the customs and social behaviours of a group of people, both as a large-scale group like a nation, or a smaller scale group like an organization.

In ***biology***, a culture is an artificially grown organisms in a nutrient media in vitro, such as in a petri dish.

igital Humanities

Digital Humanities uses computing and digital tools to create archives and databases, to analyse large amounts of text or other data, and to disseminate humanities research. Examples of recent digital humanities research includes the Dickens Code project and Virtual Vauxhall Gardens project at the University of Leicester.

xpression

OED: I: senses related to pressing or squeezing out; II: representation, manifestation.

In ***linguistics***, an expression is a phrase.

In ***algebra***, an expression is a series of symbols to represent an algebraic quantity.

In ***genetics***, an expression is 'the appearance in a phenotype of a character or effect attributed to a particular gene; also, the process by which possession of a gene leads to the appearance in the phenotype of the corresponding character.'

ormula

OED: In general scientific use, a group of symbols and figures containing a condensed tabulation of certain facts; a detailed statement of ingredients.

In ***mathematics***, a formula is a rule written as a algebraic equation.

In ***chemistry***, a formula is the symbols or figures used to describe the constituent parts of a compound.

Foresight

OED: The action or faculty of foreseeing what must happen.

'Foresight is a group of methods for exploring, anticipating and shaping the future using techniques of structured debate to analyse possible developments around complex issues such as low carbon transport or democratic urban planning. Foresight techniques aim to bridge scientific and humanistic knowledge and future-proof policymaking.'

(Shape-ID)
https://www.shapeidtoolkit.eu/wp-content/uploads /2021/09/Guide_Participatory-foresight-tools-in-Inter-and-Transdisciplinary-research.pdf

lossary

OED: A list with explanations of terms; a partial dictionary.

IDR best practice often suggests creating a project-specific glossary at the beginning of the research, to facilitate understanding of project specific terms. This could be words like glossary, for which there is one meaning, or artefact, for which there are several.

ybrid

OED: The offspring of two animals or plants of different species or varieties; anything derived from heterogeneous sources, or composed of different or incongruous elements.

Across disciplines, hybrid can be applied to the subject of research (rocks, animals, language, plants, etc.).

A hybrid event is one which happens synchronously in-person and via video-conferencing technology.

mpact

OED: the effective action of one thing or person upon another; the effect of such action; influence; impression.

REF: the demonstrable contribution that excellent social and economic research makes in shifting understanding and advancing scientific method, theory and application across and within disciplines [2021]; an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia.

In research, 'impact refers to change beyond academia' as the result of a research project. Impact activities are events, collaborations, etc. that have the potential to lead to change. (UoYork HumResCent)

Within the umbrella of impact, UKRI includes academic impact (contribution to knowledge and theory), economic and social impact, instrumental impact (influencing policy, legislation, etc.), conceptual impact (understanding of policy issues), and capacity building (through skill development).

Integration

OED: The action or process of combining into a whole.

In ***mathematics***, integration is the process of finding the answer of an equation as a whole number (integer).

In ***psychology***, integration is the 'combining of diverse parts into a complex whole, a complex state of which are distinguishable, the harmonious different elements in a personality.'

In ***sociology***, integration is a process which leads to greater participation across all dimensions of a society (economic, political, cultural, social) and can generate a sense of belonging in diverse societies.

Interprofessional

Typically seen in the context of healthcare, interprofessional describes collaboration between professionals from different professions or specialisms. As a healthcare term, it is narrower in scope than interdisciplinary research groups. It is also described as multi-professional.

n vivo/vitro/silico

OED:
in vivo: in a living organism
in vitro: in a laboratory vessel; under artificial conditions
in silico: by means of computer simulation or modelling

udgement

OED: I: the action or result of forming or pronouncing an opinion;
II: the action or result of pronouncing a legal decision, and related uses;
III: the determination of human reward and punishment by God.

nowledge

OED: I: the fact or condition of knowing something; II: the object of knowing; something known or made known.

In ***computing***, knowledge is information that a computer program can access.

In ***philosophy***, knowledge has multiple dimensions. Philosophers have identified different types of knowledge (propositional and non-propositional), as well as debating the definition of knowledge itself.

iberal

OED: free in giving; directed to a general broadening of the mind; free from restraint; favouring social reform.

In (U.S.) education, liberal arts refers to arts and humanities subjects.

In ***politics***, liberal refers to ideologies in favour of reform and individual freedom, or, capitalised, indicates political parties using the word.

In ***economics***, liberal refers to free trade.

In ***theology***, liberal refers to branches of both Christianity and Judaism that reinterpret traditions and beliefs through the lens of contemporary ideas.

ethodology

OED: the branch of knowledge that deals with method generally or with the methods of a particular discipline or field of study.

In interdisciplinary research, methodologies will be drawn from across the different disciplines involved.

Model

OED: n.: I: a representation of structure;
II: an object of imitation;
III: a type or design. adj.: serving or intended to serve as a pattern for imitation (e.g. model city, model farm).

In ***mathematics***, a model is a description of a process used to form a basis for understanding, or the description of a system using mathematical concepts. In ***mathematical logic***, a model is something that fits all the formulae within a system.

In several disciplines, including ***economics***, and ***climate science***, a model is a way of predicting what could happen, and what about that prediction could change based on specific variables. Researchers often use mathematical methods to do so.

Network

OED: A chain or system of interconnected immaterial things.

In common use, a network is often used to mean a connected group of people, especially one in which members can take advantage of knowing one another to advance their career prospects (or those of people close to them). When network is used as a verb, it typically refers to efforts made to establish or enter into these advantageous groups, or to gain contacts within them.

In ***electrical engineering***, a network is the system of cables used to distribute electricity.

In ***computing***, 'a system of interconnected computers' is called a network.

In ***mathematics***, a network is a graph in which each edge has associated with it a non-negative number.

Open

OED: allowing access or view, free from obstruction; exposed to general view or knowledge; existing, performed, or carried on without concealment; public.

Open access is 'making research publications freely available so anyone can benefit from reading and using research … also allowing others to re-use that research.'
(Jisc.ac.uk)

Open-source software is computer programs for which the source code is freely accessible to be used and/or modified.

Perspective

OED: I: senses relating to light, vision, and visualization; II: the action of looking into or through something.

In ***art***, perspective refers to the composition of a picture to give the effect of distance or three-dimensions. Artists can change how they use perspective to 'present dramatic or disorientating images.'
(see: TATE.org.uk)

Non-visually, perspective is how an individual views a topic. Researchers can therefore approach a question from various perspectives: critical, ethical, historical, etc.

Practice

OED: n.: the actual application or use of an idea, belief, or method; v. to pursue or be engaged in (a particular occupation etc.)

In ***medicine*** and ***law***, practice can mean both the premises at which they work, and the fact of doing the profession.

In ***philosophy***, practice or praxis is putting ideology or thought into action, in contrast to theory.

In ***sports*** or ***performing arts***, to practice is to prepare or rehearse for a competition or performance.

Pragmatics

OED: practical considerations or implications, esp. as opposed to theoretical, speculative, or idealistic ones.

In ***politics***, pragmatics refers to the practical considerations regarding issues.

In the theory of signs, used by ***linguistics*** and ***philosophers***, pragmatics 'concerns the relationship between speakers and their signs' (everyday conversation is general pragmatics; interviews and speeches are applied pragmatics). (Oxford Ref: Dictionary of Philosophy)

ualitative

OED: of or relating to quality or qualities; measuring, or measured by, the quality of something.

Quantitative

OED: relating to concerned with quantity or measurement; that assesses or expresses quantity.

esidual

OED: An amount still remaining after the main part is subtracted or accounted for.

In ***science***, the residual is the difference between the expected result (expressed as a value) and the actual result.

In ***geology***, it is the extent of an anomaly that remains after the less-variable degree of the anomaly has been taken into account. For example, some degree of an abnormality could be due to features that affect a wider area, the residual is the specific additional degree of abnormality.

In ***media***, residuals are royalties paid to performers, writers, etc., for a repeat of a recorded performance, e. g. repeat showings of a television show.

Responsible

OED: of a practice or activity: carried out in a morally principled or ethical way.

UKRI define responsible research and innovation as 'a process that seeks to promote creativity and opportunities for science and innovation that are socially desirable and undertaken in the public interest.' This includes ethical and environmental considerations. For example, UKRI describes responsible AI as 'the many diverse demands for AI technology that is morally and politically legitimate as a source of social power.'

Risk

OED: (exposure to) the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility.

In ***statistics***, risk is the probability of an event occurring.

In ***medicine***, the risk ratio is the ratio of probabilities of an outcome in an exposed group vs an unexposed group.

In ***business***, risk analysis is investigating and predicting risks.

In ***social science***, qualitative risk analysis involves identifying both the risks and possible methods to reduce said risks.

ignificance

OED: the meaning of a word, gesture, event, etc.; the quality of being worthy of attention.

In ***humanities***, and ***social sciences***, 'significant' tends to mean important, as in the OED definition.

In ***statistics***, significance indicates how likely or unlikely it is that a result occurred by chance. The significance level is the probability at which results are considered significant.

Superstructures

OED: a thing built on a distinct foundation; an overarching theoretical or organizational structure.

In Marxist theory, used in the ***humanities***, a superstructure is an institution or element of society thought of as a reflection of the economic system of that society.

In ***geology***, a superstructure is the upper part of a mountain range that is less affected by volcanic activity than the lower part.

In ***biochemistry***, a superstructure is the secondary, tertiary, or quaternary structure of a molecule (either protein or nucleic acid).

ystem

OED: I: an organised or connected group of things; II: a set of principles, beliefs, etc.; a scheme, a method.

A group of natural objects moving in relation to one another under the laws of nature (e.g. in ***astronomy***: solar system), or that have a common function (e.g. in biology: nervous system).

In ***computing***, a system is a group of programs, or the combined hardware software that form a computer, or a group of computers on the same network.

In ***systemic functional linguistics***, a system can be a language as a whole, or a way to represent a grammatical feature.

In ***chemistry***, a system is a scenario in which a substance can be in two or more forms simultaneously (e.g. a glass containing water and ice, with water vapour in the air above the glass).

Systems theory is the interdisciplinary study of social systems, and of relationships between systems.

heory of change

The United Nations Sustainable Development Group define the theory of change is ‘a method that explains how a given intervention, or set of interventions, is expected to lead to specific development change, drawing on a causal analysis based on available evidence.’ It also ‘helps to identify the underlying assumptions and risks that will be vital to understand and revisit throughout the process to ensure the approach will contribute to the desired change.’

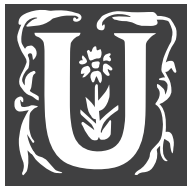
https://unsdg.un.org/sites/default/files/UNDG-UNDAF-Companion-Pieces-7-Theory-of-Change.pdf

Translational

OED: belonging to, relating to, or consisting in, translation from one language to another.

Translational research is research that has the potential to be applied to the ‘real world’, for example, clinical trials.

In ***physics***, translational motion is movement from one place to another. Translational energy is the energy an atom has because of translational motion.



rban

OED: relating to, situated or occurring in, or characteristic of, a town or city, esp. as opposed to the countryside.

A discipline prefixed with ‘urban’ specifies that the research in question is focused on urban environments. For example, urban ecology (***biology***) looks at how living organisms interact in towns and cities, urban sociology (***sociology***) focuses on the impact of urban environments on society, and urban physics is the study of physical processes in urban areas.

alue

OED: I: worth or quality as measured by a standard of equivalence; II: worth based on esteem; quality viewed in terms of importance, usefulness, desirability, etc.

In ***mathematics***, a value can be an indicator of physical quantity, an indicator of magnitude, and numbers either represented by an algebraic term or answering an equation or sum.

In ***music***, the value is the duration of note.

In ***art***, value is how light or dark a colour is, in comparison to the other colours around it.

In ***linguistics*** and ***semiotics***, the value generally means the meaning, but also the role of a sign within its system.

Generally, a value is also a principle used by a person to decide how to act in different environments, e. g. growth, responsibility, curiosity. In humanities disciplines like ***philosophy*** and ***theology***, definitions of value can be more specific.

icked Problem

Horst Rittel and Melvin Webber described ***governmental planning*** problems as '"wicked" problems,' offering ten characteristics resulting from the problems being 'ill-defined' ones which 'are never solved.' The term has been adopted to describe many of the sort of problems that IDR is interested in, such as climate change or poverty, for which instead of one true solution there are infinite possible solutions, and there is not a final answer to the research questions.

Horst Rittel and Melvin Webber, 'Dilemmas in a General Theory of Planning,' *Policy Sciences*, vol. 4, no. 2 (1973), pp. 155-169

Comple

OED: adj. I: Consisting of or comprehending various parts united or connected together; formed by combination of different elements; composite, compound;

II: complicated, involved, intricate; not easily analysed or disentangled.
OED: n. A whole comprehending in its compass a number of parts, esp. (in later use) of interconnected parts or involved particulars; a complex or complicated whole.

In ***psychology***, a complex (n.) is an emotional reaction connected to a particular subject, typically with a descriptive prefix (e.g., inferiority complex).

When complex is used as a prefix to another noun (e.g., complex sentence), it is indicating that it is more complicated than usual.

Complexity theory

In ***computing***, complexity theory is used to rank tasks according to the resources needed to solve them, and to understand why certain problems are more difficult to solve.
In ***economics***, complexity theory is used to give an order to the behaviour of complex systems, from national economies to production lines.

In ***strategic management***, complexity theory is used to think about how organizations adapt to different environments or crises.

Monodisciplinar

The opposite of interdisciplinary.

one

OED: More or less vaguely: A region or tract of the world

In ***geography*** and ***astronomy***, a zone is a region defined by either climatic or other differences, or by lines of latitude or declination. In ***mathematics***, a zone is a similarly defined region on a sphere.

In ***town planning***, a zone is an area of land for which there are specific regulations regarding the use of the land (e.g., residential, commercial, etc.).

In ***sports***, a zone is an area of the playing-field or court.

Colloquially, to be 'in the zone' is to be in a state of flow, to be performing a task easily and in a focused manner.

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