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Etymology of Technical Vocabulary in English

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English as a global language is the language of business, finance, science and technology. Today millions and millions of people speak English as their native language. In addition to its many millions of people use English as their second language. To speak English effectively and efficiently one should need to develop vocabulary. Vocabulary occupies a central place in learning a language. In every language, vocabulary of that language can be distinguished from other non-vocabulary entities of that language. Vocabulary building takes patience and continued effort. Vocabulary should change and grow to meet the needs of an industry and an individual. Moreover, the technocrats need technical vocabulary to convey the concept without blemish.

Technical vocabulary is a special vocabulary, generally within the group of learned people. Here is an intimate relation between the concepts that is being expressed by the word and the word itself. As R.M.W. Dixon states in the book *Word: A Cross – Linguistic Typology*, "the word is the smallest independent unit of language referring to a certain linguistic reality or to a relation of such realities and characterized by certain formal features (acoustic, morphemic) either actually (as an independent component of the context) or potentially (as a unit of the lexical plan)." (Pg: 5)

Words, like facts, are difficult to remember out of context. Remembering is greatly facilitated when the students have a body of information with which to associate either a word or a fact i.e. ***Etymology***. *Etymology* is the study of the origin of words. For words, interesting origins or histories will help provide a context. For example, a *hippopotamus* is a "river horse," from the Greek *hippos*, meaning "horse," and *potamos*, meaning "river."

The English language is living and growing. Although many of vocabulary have been part of our language for many years, new words are added all the time. Technical vocabulary forms a major constituent in this criterion. A technical vocabulary item belonging to a particular technical subject or technical context indicates specific meanings, the same item with the same physical features. But, in the context of another technical subject or technical context, it may indicate different specific meanings. At times, a vocabulary item used as a technical term may indicate one meaning in the technical content and another different meaning in the language of daily life. **For example**: 'sound' in physics is different from 'sound' in physical education, and 'sound' in the language of day-to-day life. This is an important characteristic of the technical vocabulary.

Technical vocabulary is words or phrases that are used primarily in a specific line of work or profession. For example, people who work in the steel industry often use words like 'Rockwell', 'Olsen', 'cup test' and 'camber'. These words have special meanings pertaining to the manufacture of steel. Similarly, an electrician needs to know technical words such as 'capacitor', 'impedance' and 'surge capacity'. These technical words never used by most people outside of that industry.

In this article I tried to put forward how the technical vocabulary is 'created' along with technical inventions either by borrowing or by translating the concept into the native language by most prevalent processes of vocabulary production such as ……..

1. Compounding
2. Affixation
3. Clipping
4. Portmanteau
5. Acronyms
6. Onomatopoeia
7. Eponyms

1. COMPOUNDING

Compounding is another common word formation process. It is probably the most common one in today's English because it is very effectively used in technical languages. Compounding is a process whereby two or three morphemes are combined as one word. They differ from both derivational and inflectional

affixation as they are the exclusive amalgamation of two or three morphemes. Use of hyphenated compounds in technical English is common and this makes comprehension a bit more challenging. In such cases, the concatenation further widens the scope of ambiguity.

For example: 'Airbus'
'Back-up'
'Butt - weld'
'Condenser – extraction pump'
'Drawing board'
'Firewall'
'Fire – tube - boiler'
'Fly- by – wire controls'
'Gas engine'
'Heat- affected zone'
'Machine tools'
'Programming Language'
'Water- proofing'

2. AFFIXATION

Affixes are the pivotal point of word formation in technical English. Greeks and Romans came up with a system for creating words by putting together smaller word parts either before or after the root word. They used three types of word parts: prefixes, suffixes, and roots. *Pre* means "before," and so it makes sense that a prefix comes before the main part of a word. *Suf* means "after," and so a suffix comes at the end of a word. A root word is the main part of a word, and usually comes in the middle. Many English words are composed of at least one root, and many have one or more prefixes and suffixes.

a) Prefixes: It has been estimated that sixty percent of the English words in common use are made up partly or entirely of prefixes or roots derived from Latin and Greek. The value of learning prefixes and roots is that they illustrate the way much of our language is constructed. Once learned vocabulary helps to recognize and understand many words without resorting to a dictionary. With one well-understood root word as the center, an entire constellation of words will be built up as in the examples given below----

i) Counting prefixes: quantify the root

a- "lacking" asymmetry, abacus
Amphi - "both, around": amphitheatre
bi- "twice, double" bimetallic, bicycle, bipolar, biplane, bias
di- , dia-: "two" dichloride, dioxide, diameter
Mono- "one" monograph, monorail
Multi- "many" multifaceted, multimedia
Octa- "eight" octagon, octane, octahydral
Oligo- "few" oligotrophic
Poly- "many" polygamy, polyangular, polysilicon, polymer
Tri- "three" triangle, tridimensional, tripod, tricycle
Uni- "one" unilateral, unification

ii) Involvement Prefixes: say something about the kind of involvement of the participants in the action

Anti- "opposed, instead, against" antidote, antacid, antifreeze
Auto- "self" automatic, automation, autopilot, automotive
Co- "together, jointly" cooperate, coexistence, co-pilot
Contra- "against, opposite" contradiction, contraband, contraflow
Vice- "in place of, instead" viceroy, vice- versa, Vice squad

iii) Judgement Prefixes: judgement about the root
Dis- disturb, disgruntle, disarm, disarray, disconnect, dismantle
Dys- "bad, badly" dyslogistic, dysentery
Eu- "good, well" euphoria,
Extra- "outside the scope of" extraordinary, extraterrestrial, extrapolate, extramural
Mal- "ill, evil, wrong" malnutrition, maladjusted, maladroit, malfunction
Meta- "changed, transcending" metaphysics, metalanguage
Mis- "badly, wrongly" misuse, miscalculate, misapply, misfiring

Pro- "on behalf of" pro-education, propeller, propulsion, profile
Proto- "first, chief" prototype, protocol
Pseudo- "false, deceptive, resemblance" pseudonym, pseudo forces

iv) Locative Prefixes: place or direction

Ab-, a-, abs- "from, away" abnormal, abhor, ablaze
Ad- "toward" admit, advance
Ana- "back" anatomy, analogy, anagram
Apo- "away, from" apology
Cata- "down, away, back, opposite" catastrophe, catapult
Circum- "around" circumcise, circumspect, circumflex
Counter- "against, opposite" counterfeit, counterargument
De- "away from, down" degenerate, defoliate, deactivate, denature
Dia- "across, through" diachronic, diameter, diabolic, diadem
Ecto-, exo-: "external" ectoderm, ectopic, exocentric, exo-bar,
En- "in, into" enclose, entrophy, enclave, encore
Endo- "internal" endoscopy, endocyclic,
Epi- "on, over" epidermal, epicure, epidemic
Ex-, ec-: "out from, away" eccentric, excavate, exclaim
*In- "*in, into, within" intransitive, inanimate, inboard, inlet, intake
*Infra- "*below, beneath, within" infrastructure, infrared
Inter- "between, among" internet, interaction
Intra-, intro- "inside" introduction, intramural, intractable
Ob- "toward, against" obfuscate, obduracy
Para- "beside, along with" paramedic, parameter, parabola
Per- "through, thoroughly" performance, percolator, perceptual
Peri- "around, nearby" perimeter, perinatal
Pro- "in front of" profile, proponent, propulsion, propeller
Pros- "concerning, toward" prosody
Retro- "backwards, back" retrospective, retroactive, retrofit
Sub- "under, below" subway, submarine, subtractive, subatomic
Super- "over, above" superlative, super active
Sur- "over, beyond, above" surrealist, surprise, surcharge
Syn- "with, together" syntax, synthesis
Trans-"across, surpassing" transgression, transformer, transmitter

v) Measurement Prefixes

Crypto- "secret, hidden" cryptography
Hyper- "over, to excess" hypermedia, hypertension, hyperbola, hyperinflation
Hypo- "under, slightly" hypoglossal, hypotension, hypochondria,
Is-, iso- "equal" isotope, isobar, isolation, isometrics
Macro- "large, broad scale" macroeconomics, macroscopic, macrobiotics
Micro- "tiny, small scale" microscope, microampere, micro unit
Mid- "middle" midnight, midair, midcap,
Semi- "half, partly" semifinal, semi-conductor
Ultra- "beyond, extreme" ultraviolet, ultrasonic, ultramarine

vi) Negative Prefixes

Dis- "apart, reversal, lacking" displace, disarm, disarray, disability
In - "negative" incredible, insufficient, inadequate, inaccurate
Im- "negative" improper, imperfect, imprecise
Mal- "not" malfunction
Non- "not" nonsense, noncustodial
Ob- "inverse, in the opposite directions" object, objector
*Se- "*apart" separate, sedate
Un- "not, opposite" uneven, uncoordinate, uncontrol, unproduct, unaffected

vii) Temporal prefixes: time and duration
Ante- "preceding" ante-post
Fore- "before" foreword, forecast

Neo- "new, recent" Neolithic, neonatal
Post- "after, behind" postcode, post cord
Pre-, pro- "before, in front of" preface, precautions, procedures
*Re- "*anew, again, back" regenerate, revision, redesign, recycle, reinvent
Re-, "together" reconnect

b) Suffixes:

Suffix is an affix which is placed after the root of a word. Common examples for suffixes are case endings, which indicate the grammatical case of nouns or adjectives and verbs endings which form the conjugation of verbs. But in deriving technical vocabulary it place a major role in origin of new words. Other names for it are Postfix or Ending.

i) Deriving adjectives from nouns and verbs

-able "fit for doing, fit for being done" comfortable
-al (-ial, -ical, -ual) "having the property of" radical, dual, professional
-ary "having a tendency or purpose" stationary
-ate "full of" passionate, recapitulate
-ful "full of X" skillful
-iac "pertaining to the property of" maniac
-ic "having the property of" dynamic, medic, hydraulic, electronic, plastic
-ish "to become like X" stylish
-ive "characterized by" passive
-less "without, free from" stainless (steel)
-ly "appropriate to, befitting" timely, tightly
-ory "connected with, serving for" obligatory, accessory (equipment)
-y "full of, characterized by" mighty, noisy

ii) Forming abstract nouns

-asy, -acy "state or quality" accuracy
-age "condition, state, rank, office of" coinage, postage, barrage
-ance, -ence "state, act, fact of" emergence
-ade "general noun" salad, parade, lemonade
-al "act of" chemical, mechanical, physical, structural, operational
-ation "state of being X-ed" information, aviation, configuration, validation
-ia "condition of" inertia
-ial "differential, industrial
-icity "abstract noun from – ic" felicity, electricity
-ism "doctrical system of principles" constructivism, professionalism
-ity "state, quality, condition of" unity, complexity, solidity, fragility
-ment "condition of being X" equipment, experiment, requirement
-ness "state, quality, condition of" innateness, thickness
-ship "state, condition of" guide ship, airship, (large) cruise ship

iii) Forming agentive nouns

-ant, -ent "one who" agent, occupants, consultant
-arian "member of sect, holding to a doctrine" authoritarian
-ast "one associated with X" enthusiast
-er "agent" worker, boiler, engineer, designer, manufacturer
-or "agent" contractor, stimulator, supervisor, surveyor, inventor
-ist "one connected with, often agent" artist, specialist, scientist
-ician "one skilled in some art or science" technician, electrician

iv) Forming verbs from roots and stems

-ate "cause X to happen" terminate
-en "to become" liken, darken, harden, soften
-ify "to cause to (be) X" rectify
-ize "to cause to be X" realize, anodize, galvanize
-let "diminutive" booklet,

3. CLIPPING

Clipping or *truncation* is a process whereby an appreciable chunk of an existing word is omitted; leaving what is sometimes called a *stump word*.

i) **Fore - Clipping**: Less common in English are *fore-clippings*, in which the beginning of a word is dropped: thus *phone* from *telephone*. Some more examples of fore – clipping are:

Bus – moni*bus*
Burger – Ham*burger*
Chemist – al*chemist*
Plane - aero *plane*
Varsity - uni*versity*

ii) **Back - Clipping:** When it is the end of a word that is lopped off, the process is called *back-clipping*: thus *examination* was docked to create *exam* and *gymnasium* was shortened to form *gym*. Examples for Back – Clipping technical vocabulary are ---

*Ad- ad*vertisement
*Auto – Auto*mobile
*Bike - bi*cycle
*Cab – cab*riolet
*Demo- demo*nstration
*Fax- Fa*csimile
*Sky-lab – Sky- lab*oratory
*Memo-memo*randum
*typo - typo*graphical error

iii) Front back clipping: Fridge – re*frige*rator
Tec – de*tec*tive

4. PORTMANTEAU

The portmanteau words, otherwise called as Blends, indicate the blending of two words. Portmanteau is the name of a suitcase that can comprise different types of tightly packed articles. Similarly, T.C. Baruah in the book *English Teacher's Hand Book* states that portmanteau words are the combination of different words fused together into one (Pg: 86). Perhaps this type of word formation has become a common aspect as it enriches the scientific and technical jargon of scientists, engineers and technologists.

For Example:
Biological Electro***nics*** – Bionics
Mechanical Elec***tron***ics – Mechatron
Modular ***Dem***odulator – Modem
Nanotechnology Informa***tics*** – NanoTics
Reduction ***Ox***idation – Redox

5. ACRONYMS

The initials for the names of things may actually come to replace the names. The initials become the words that represent the thing, concept, or group. The following are examples of words that have developed from initials. Many technical and scientific acronyms reflect the artistic sense of their creators.

For Example:
ARM : **A**dvanced **R**isk **M**achine
BAT : **B**andwidth **A**llocation **T**echnology
BASIC : **B**eginners **A**ll-purpose **S**ymbolic **I**nstruction **C**ode
BIT : **B**inary **D**igit
COMICS: **Co**oled **M**id-**I**nfrared Camera and **S**pectrometer
FAT : **F**ile **A**llocation **T**able
FROG : **F**requency-**R**esolved **O**ptical **G**ating
IDEA : **I**nternational **D**ata **E**ncryption **A**lgorithm
INTERNIC: **Inter**net **Net**work **I**nformation **C**enter
NAP : **N**etwork **A**ccess **P**oint
MPV : **M**ulti - **P**urpose **V**ehicle
MIME : **M**ultiple **I**nternet **M**ail **E**xtension
OASIS : **O**rganization for the **A**dvancement of **S**tructured **I**nformation **S**tandards
POST : **P**ower **o**n **S**elf **T**est
PAN : **P**ersonal **A**rea **N**etwork
SPIDER: **S**pectral **P**hase **I**nterferometer for **D**irect **E**lectric-field **R**econstruction

SQUID : **S**uperconducting **Qu**antum **I**nterference **D**evice
SMART: **S**elf- **M**onitoring **A**nalysis and Reporting **T**echnology
TV : **T**ele**V**ision
WIT : **W**ireless **I**nformation **T**erminal

6. ONOMATOPOEIA

Onomatopoeia is simply a word that imitates a sound associated with what is named. The word 'onomatopoeia' comes from the combination of two Greek words, one meaning 'name' and the other meaning 'I make,' so onomatopoeia literally means 'the name (or sound) I make.' The use of such words of onomatopoeia is for rhetorical effect. Sounds that begin with 'cl-' usually indicate collisions between metal or glass objects, and words that end in '–ng' are sounds that resonate. Words that begin with 'th-' usually describe dull sounds like soft but heavy things hitting wood or earth.

For Example: Bomb, Bang, crash, clang, clank, clap, clatter, click, clink,
Ding, jingle, screech, slap, sizzle, splat,
Thud, thump

7. EPONYMS

Over time, names of people, places, or things may become generalized vocabulary words. When a person invents or introduces something, that thing becomes associated with the person's name. The person, through time, is forgotten while the name lives on in our language.

For Example:

Angstrom – unit of distance with the name of Anders Jonas Angstrom
Diesel Engine - invented by Rudolf Diesel
Eiffel Tower – Gustave Eiffel, designer of Eiffel Tower
Fahrenheit Scale – Gabriel Fahrenheit
Moog Synthesizer – Robert Moog, an analog synthesizer
Skoda – Emil Skoda, founder of it
Curim – chemical element named after Marie and Pierre Curie, Scientists
Mesmerize - F.A. Mesmer, an Austrian doctor and hypnotist.
denim - from *serge de Nîmes* (a fabric made in Nîmes, France)
Bunsen Burner – invented by Robert Wilhelm Bunsen, a German chemist
Celsius Thermometer – invented by Anders Celsius, a Swedish professor of astronomy

CONCLUSION

Technical words newly origin in the field of engineering often reflect current interests, trends, and innovations through technology and products. One of the most recent contributors to English language has been computer and information technology, which has created words such as *bytes, monitor* and *disk*…etc. Another way new words come into our language is through the development of products. Some examples include: Kleenex, Walkman, Scotch tape, Xerox, and Linoleum.

One of the interesting ways to improve the vocabulary of an engineering student is by making them to know the origin of the word. Etymology of technical vocabulary in detail is very important element of language learning and teaching new technical terminology. Different types of instructional modes, approaches, vocabulary building activities and skills proved to be effective in developing students' vocabulary in classroom environment itself. Practicing vocabulary in context, combining vocabulary with reading and writing activities, and providing the students with different lexical information about the words enhanced students' vocabulary acquisition. Keeping the pitfalls and limitations in consideration, the teacher of English has to take the work of increasing and developing vocabulary of the students, in the hands by integration of different forms of vocabulary production such as Compounding, Affixation, Clipping, Portmanteau, Backformation, Acronyms and Onomatopoeia helped an engineering student to learn and retain vocabulary for future.

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