Duality of Meaning of some English Words: What's on the Minds of Beginner Mining and Related Engineering Students?*

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Abstract

The paper studied the meanings of 12 selected English words as written by 289 First Year students offering Mining and Related Engineering programmes at the University of Mines and Technology (UMaT), Tarkwa. The words, namely *elevation, surveying, function, sign, model, drive, conductor, power, force, stress, spring,* and *shear* have more than one meaning each - a normal meaning, and a scientific/engineering meaning. The objective of the study was to discover what goes on in the beginner engineering students' minds when communicating in English, using those words and thereby find out whether they know both the scientific/engineering meanings and the normal meanings of the words. The "writing" exercise was not a test, so the students were relaxed and wrote all the meanings they naturally knew for each word, anonymously, but without reference to dictionaries. The responses were sorted out into five categories as appropriate. The results showed that, out of a total of 289 students, 84 (29.07%) gave only scientific/engineering meanings of some words, 153 (53.00%) gave only normal meanings of some words, 15 (5.16%) gave both scientific/engineering meanings and normal meanings of some words, 32 (11.07%) gave no meanings (nil) of some words, and 5 (1.70%) gave wrong meanings of some words. Contrary to expectation, the majority of the students gave either scientific/engineering meanings only or normal meanings only of some words. Only a few gave both scientific/engineering meanings and normal meanings of some words. Thus, the students possibly have vocabulary challenges. To overcome the challenges, the students should learn and use the different meanings of English words appropriately; lecturers should explain the shades of meaning whenever such words are met in speech or writing; polysemy and homonymy should be emphasised in the Communication Skills syllabus**;** and yearly follow-up research to track the students' progress should be conducted.

Keywords: Mining, Engineering, Normal, Scientific, Meaning

1 Introduction

1.1 Background and Literature Review

Languages display words for communication and words may display more than one meaning. A word in the English language may take on several meanings depending on context and other factors and this could be true of other languages (Thakur, 2007). In fact, the dictionary lists several meanings for many polysemic words. Sometimes, a word has more than twenty meanings. For instance, in *The New Collins Dictionary and Thesaurus in One Volume*, 1987 (Anon., 1987), "service" has twenty-four different shades of meaning (p. 912). Yet, "sequence" as a noun has seven meanings listed for it and "septum" has only one (p. 910).

Usually, however, there is a first meaning which is non-technical and therefore the one most likely to be known. This is the normal, common or everyday meaning of the word. When words convey meanings other than their common ones, their users may be trying to achieve a certain effect, say, emphasis, which may be stylistic. The use of words to communicate about a special field of endeavour may also call for special meanings different from the normal ones. This takes us to the technical or specialised sense of certain words.

The use of words (and expressions) to communicate about specific disciplines is an aspect of register and is also referred to as jargon. According to Hudson (1990), register as a term is widely used in sociolinguistics to refer to language variations according to *use* as opposed to dialects defined as language variations according to *user* (Halliday *et al.*, 1964; Crystal and Davy, 1969; Gregory and Carroll, 1978). Generally, register as a language variation according to *user* is defined by variables such as social background, geography, sex and age (Halliday *et al*., 1964).

In this paper, register means the choice of specific vocabulary associated with a subject under discussion such as law, engineering and mathematics. This is what Quirk and Greenbaum (2000) call "varieties according to the subject matter involved in a discourse" (p. 6). According to them, the presumption here is that "the same speaker has a repertoire of varieties and habitually switches to the appropriate one as occasion arises" (p. 6). Finegan (2008) observes that language switching could be occasioned by a change in any one of several situational factors which include the setting and purpose of the communication, the audience or addressee, the social relations between the speaker and the audience (interlocutors), and the topic under discussion. Three main elements which determine a speech situation can therefore be

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summed up as purpose (activity and goal); setting (topic, location and mode) and participants (speaker, addressee, social roles of speaker and addressee); and character of audience.

Discussing "Semantic Markers of Register", Finegan notes further that a particular word conveys different meanings in different registers, and he illustrates this view with the word "notes". He observes that while it carries its common, everyday meaning as "brief, informal written messages on any topic" (p. 327), "notes" in a legalese discourse could mean "promissory notes, or IOUs" (p. 326). Examples of other words conveying a clear meaning in legalese are *save, party, hearing, action, executed, suit, sentence, rider, motion and consideration.* Lawyers and also some clients may assign specialised meanings to words. Apart from the register of law, criminal jargon also has words and expressions that are commonly used yet transmit a meaning different from the one involving the behaviour of criminals. For example, in the context of criminal behaviour, *mob, hot, fence, sting, sing, racket, a mark, bug, bird cage, slammer and joint ('prison')* belong to general criminal jargon vocabulary while others like *crack, coke, pot, grass, high, down, speed, pusher, dealer* and *joint ('marijuana cigarette')* belong to drug world jargon. Finegan (2008) rightly points out that "Each of these expressions bears one meaning in everyday situations but a different meaning in the underworld" (p. 327).

Also, words may present similar characteristics but may be different, bringing us to the word relationships known as homonyms, homophones and homographs. A word (homonym) may be spelt the same and sound the same as another but have a different meaning (e. g. *bear* and *bear* and *tear* and *tear*). When two or more different (written) forms have the same pronunciation, they are said to be homophones (e.g. *bare* and *bear*, *meat* and *meet*, and *to*, *too* and *two* (Yule 2006). Or a word (homograph) may be spelt the same as another word but is quite different in meaning, grammar or pronunciation (e. g. *bow* as in "bow and arrow" and *bow* as in "take a bow"; *tear* (a verb) as in "tear a paper", or *tear* (a noun) as in "wear and tear"; or "liquid fluid from the eye when crying" and *record* (a verb) as in "write down" or *record* (a noun) as in a document (see Mireku-Gyimah, 2003; 2008; Algeo and Pyles, 2004). Whereas homonyms "are two or more words having the same written and/or spoken form", Thakur (2007) points out that a "polysemic word … is a word having two or more related meanings. In a dictionary, homonyms are, therefore, listed as separate words but the multiple meanings of a polysemic word are usually listed under the same entry" (pp. 37-38). Engineering, like law and other professions, also uses certain words in common use in some specialised sense, "engineerese" (?). It is important then that users are able to understand and use words as appropriate in their contexts just as they put on appropriate clothing for church, the beach and the bedroom.

1.2 Statement of the Problem

It would be observed that register is reflected in the engineering student's use of the English language, and students would invariably become familiar with words which are common in their fields of study. Yet, it is believed that the engineering student operates on two levels, as an ordinary user of the English language and also as a would-be specialist or professional, and should therefore take care to know the various uses of a word apart from the technical or scientific/engineering sense because the same word may have other commoner, normal or everyday meanings. Knowing both the scientific/engineering sense and the normal sense of words would help the student avoid confusing his/her audience or even himself/herself as he/she sends and receives messages, whether at home or at the workplace. In all communication situations, the engineering student must be able to switch correctly to the appropriate word family each time and operate smoothly for acceptability and communication effectiveness. In the case of written communication, this smooth operation expected of engineering students should include the correct spelling of words. As they are studying to become professional engineers, it is necessary that the students know and understand the different shades of meaning of the words they meet (which we have narrowed down to normal and scientific/ engineering). The question is whether or not they would be aware of the different levels of the meaning of such words. A more important question would be if they would be able to send and receive information containing the same words in varying contexts which are non-technical, or unscientific/non-engineering.

This paper argues that, in the case of the science students at University of Mines and Technology (UMaT) studying to become engineers and mathematicians, they would know the different levels of meaning of certain words which are also used frequently in their own programmes of study, that is to say, they will recognise the duality of meaning and will know both senses, which are the scientific/engineering and the normal meanings of those words. However, since they are frequently talking or learning in the context of science, technology and engineering, these students of mining and related disciplines would tend to give, first and foremost, scientific and engineering related interpretations to certain words, which are used both in ordinary discourse and science and engineering discourse when these words with double/multiple meanings are stated in isolation, that is, without placing them in any particular context. As a follow-up to this, it is likely that they

will confuse unfamiliar ordinary words which look like some other words that belong to the register of science and engineering and thereby misspell some words.

1.3 Objective

The objective of this research is to discover whether beginner science and engineering students at UMaT know the scientific/engineering meanings at the same time as the normal meanings of some 12 selected English words- *elevation, surveying, function, sign, model, drive, conductor, power, force, stress, spring* and *shear*- which they meet in their programmes of study and also in everyday discourse. The paper investigates the duality of meaning of the words and what is actually on the mind of the engineering student when he/she hears or uses these words, which are in everyday use, with normal meanings but also happen to be part of the special vocabulary or register of science and engineering as a discipline, and thus a set of lexical items in the minds of science and engineering students, which they will invariably fall on first. We speak of duality to mean that the engineering student has, at least, two main meanings in his or her mind for certain words in English, which, without any doubt, mean different things to the non-engineer and the engineer. Whereas the non-engineer quickly thinks of their ordinary normal meanings, the scientific/engineering person, especially the student who happens to be a beginner, would easily think of the scientific or engineering sense. Consequently, the paper also seeks to study why some engineering students tend to explain words in the light of science, technology and engineering even when no particular context has been given. "So when a word such as *power*, or *conductor*, or *force*, is mentioned out of context, where exactly does the engineering student's mind go first for interpretation and why?" The motivation to find answers has been some observations made by the author in the lecture room as a lecturer of Communication Skills to beginner mining and related engineering students, some of whom, sometimes, consciously or unconsciously interpret words by considering the words first as part of the particular register of the subject matter, which happens to be their science and engineering programmes, or the professions for which they are being trained.

2 Materials and Methods Used

A short exercise– not a test of any kind- was conducted at the very beginning of the second semester of 2015 among a group of First Year (Level 100) mining and related engineering students of UMaT to confirm or disconfirm the hypothesis that users of the English language who are engineering students would recognise the duality of meaning of the 12 selected words and know both their scientific/engineering meanings and their normal meanings and that they would think the scientific/engineering meanings first if they were asked to explain or define those English words out of context.

In all, 289 out of 387 students (constituting 74.68%) took part in the exercise and they happened to be all those who attended the Communication Skills lectures on the days of the exercise. They were from eight out of the ten departments, four from each of the two faculties (Faculty of Mineral Resources Technology [FMRT] and Faculty of Engineering [FoE]). For FMRT, there were 29 out of 52 from Mining (MN), 36 out of 49 from Mineral (MR), 36 out of 45 from Geomatic (GM), and 43 out of 47 from Geological (GL) Engineering Departments. For FoE, there were 36 out of 53 from Electrical and Electronics (EL), and 33 out of 53 from Mechanical Engineering Departments; then 46 out of 53 from Computer Science and Engineering (CE) Department. In addition to these, there were 30 out of 35 from Mathematics (MA) Department. The mathematics students may not be strictly engineering students; nevertheless, they are still science students and so were included in the study (see Table 1).

Table 1 Departments/Programmes and Students

Department/Programme	Total No. of Students	No. of Participating Students
Mining Engineering (MN) I	52	29
Mineral Engineering (MR) I	49	36
Geomatic Engineering (GM) I	45	36
Geological Engineering (GL) I	47	43
Electrical and Electronics Engineering (EL) I	53	36
Mechanical Engineering (MC) I	53	33
Computer Science and Engineering (CE) I	53	46
Mathematics (MA) I	35	30
Total	**387**	**289**

All the students were instructed to write down for each of the selected words as many meanings as possible just as these meanings occurred to them, naturally, and as they readily understood them. Thus, they were not restricted to the number of meanings they could give to a particular word. However, they were not to discuss their answers and they were not to consult any dictionary. The researcher conducted the work herself and ensured that they had no recourse to external help. They were reassured that the exercise was not a quiz or test and did not form part of any of their continuous assessments at all and so their names were not even needed. They therefore did the work anonymously, in a relaxed manner and took their time to provide as many shades of meaning as they could and therefore really knew.

The scripts were collected from each participant and the responses sorted out into normal meanings and technical or scientific/engineering meanings of the words, using dictionary meanings as a guide (see Table 2). Synonyms and any responses that were in line with these meanings were accepted. The meanings were broadly considered in both cases and not restricted to a particular subject matter or discipline. Also, the responses did not have to be sentences or the exact wording in the dictionaries because the students were not given access to any such help. So, in the normal sense, for example, "promotion" was accepted for *elevation*, and in the scientific/engineering sense, a formula: "y = ax + c", was accepted for *function*.

Considering that some students wrote no meaning(s) at all for some words and wrong meaning(s) for some words, we then put the responses of students of each programme for each word into the following five categories as appropriate:

(i) Scientific/engineering meaning(s) only;

(ii) Normal meaning(s) only;

(iii) Both (i.e. both the scientific/engineering meaning(s) and the normal meaning(s));

(iv) Nil (i.e. no response); and

(v) Wrong (i.e. wrong meaning(s)).

3 Results and Discussion

3.1 Results

The detailed results of the study are shown in Table 3. It is instructive to note that each student gave to each word a response (including nil) that belonged to a particular category, and all responses in each category were counted. Therefore, the number of responses for each word in each category equals the number of students whose responses belonged to that category. For example, the number of students in the Mining Engineering (MN) Department/Programme is 29 (see Table 1). Hence, for *elevation*, the number of responses in each of the five categories: 2, 18, 2, 7, 0 sum up to be 29, which is also the number of participating students in MN I. See Table 3.

Table 3 therefore shows, for each word, and in each group of students, the number of students who wrote the scientific/engineering meanings only; the number of students who wrote the normal meanings only; the number of students who wrote both the scientific/engineering meanings and the normal meanings; the number of students who wrote nothing (nil); and the number of students who wrote wrong meanings. For a clearer picture, the results are summarised in Tables 4 and 5.

Table 4 is a summary of the results showing for each word and from all the groups of students, the combined number of students who wrote the scientific/engineering meanings only; the combined number of students who wrote the normal meanings only; the combined number of students who wrote both the scientific/engineering meanings and the normal meanings; the combined number of students who wrote nothing (nil); and the combined number of students who wrote wrong meanings. Since the total number of students from all the groups was 289 and each student wrote the meaning(s) he/she knew for each of the 12 selected words, the total number of responses from all the students is: 289 x 12 = 3468, as can be seen in Table 4.

Table 2 Words and Meanings

Word	Meaning	
Elevation	Normal	- the act of elevating or the state of being elevated; nobleness - a raised area; height
	Scientific	- A drawing to scale of the external face of a building or structure - the height of something above a given place, especially above sea level; another name for altitude - the angle formed between the muzzle of a gun and the horizontal
Surveying	Normal	- looking at or considering something closely (esp. in order to form and opinion); looking around to familiarize with something or a situation; examining
	Scientific	- the setting out on the ground of the positions of proposed construction or engineering works - the study or practice of making surveys of land
Function	Normal	- the natural action of a person or thing - the intended purpose of a person or thing in a specific role - an official or formal social gathering or ceremony - to operate or perform as specified - to perform an action or role
	Scientific	- A factor dependent upon another or other factors - A relation between two sets that associates a unique element of the second with each element of the first
Sign	Normal	- something that indicates a fact, condition, etc, that is not immediately or outwardly observable - an action or gesture intended to convey information, a command, etc; - a board, placard, etc, displayed in public and intended to give information, etc - an arbitrary mark or device that stands for a word, phrase, etc. - an indication or vestige - a portentous or significant event - the scent or spoor of an animal - to write as a signature to… in attestation confirmation, etc
	Scientific	- any symbol used to indicate an operation, - the positivity or negativity of a number, expression, etc - any objective evidence of the presence of a disease or disorder
Power	Normal	- ability to do something - a specific ability, capacity, or faculty - political, financial, social etc. force or influence - control or dominion or a position of control, dominion or authority - a state or other political entity with political, industrial, or military strength - a person or group that exercises control, influence or authority. - a prerogative, privilege or liberty - legal authority to act for another
	Scientific	- the value of a number or quantity raised to some exponent - a measure of the rate of doing work expressed as the work done per unit time - the rate at which electrical energy is fed into or taken from a device or system - a particular form of energy - to fit with a motor or engine
Shear	Normal	- to remove (the fleece or hair) of (sheep, etc) by cutting or clipping - to cut or cut (something) through with shears or a sharp instrument - to strip or divest - to move through by or as if by cutting - either one of the blades of a pair of shears, scissors, etc.
	Scientific	- to cause to deform or fracture or to deform or fracture as a result of excess torsion - a form of deformation or fracture in which parallel planes of a body slide over one another - the deformation of a body, part, etc., expressed as the lateral displacement between two points in parallel planes divided by the distance between the planes

Table 2 Words and Meanings (Cont.)

Force	Normal	- strength or energy; power - exertion or the use of exertion against a person or thing that resists - intellectual, political, or moral influence or strength; a person or thing with such influence - to compel or force to do something through effort, superior strength, etc - to acquire or produce through effort, superior strength, etc - to impose or inflict
	Scientific	- a dynamic influence that changes a body from a state of rest to one of motion or changes its rate of motion - a static influence that produces a strain in a body or system
Spring	Normal	- to happen or cause to happen unexpectedly - to move or cause to more suddenly upward or forwards in a single motion - to leap or jump over - to come or arise suddenly - to come into being or appear suddenly - a natural outflow of ground water, as forming the source of a stream - the season of the year between winter and summer
	Scientific	- to release or be released from a forced position by an elastic force - the quantity of resilience; elasticity - a device, such as a coil or strip of steel which stores potential energy when it is compressed, stretched, or bent and releases it when the restraining force is removed - a structural defect such as a warp or bend
Drive	Normal	- to push, propel or be pushed or propelled - to guide the movement of - to compel or urge to work or act - to goad into a specified attitude or state - to cause to make (a hole, crack, etc)
	Scientific	- to move rapidly by striking or throwing with force - to excavate horizontally; or a horizontal opening in the underground mine - the signal applied to the input of an amplifier - A very small, portable, solid state device that can be inserted into a USB port for storage and retrieval of data; disk drive
Model	Normal	- a representative form, style, or pattern - a person who poses for a sculptor, painter or photographer - a person who wears clothes to display them to prospective buyers; mannequin - a preparatory structure from which the finished work is copied
	Scientific	- a representation, usually on a smaller scale of a device, structure, etc - a design or style of a particular product - a mathematical equation
Conductor	Normal	- An official on a bus who collects fares - A person who conducts an orchestra or choir - A person who leads or guides - A railway official in charge of a train
	Scientific	- A substance, body or system that conducts electricity, heat, etc
Stress	Normal	- special emphasis or significance; importance - mental, emotional, or physical strain or tension - emphasis placed upon a syllable by pronouncing it more loudly than those that surround it
	Scientific	- A force or a system of forces producing deformation or strain

Sources: Anon., 1999, Anon., 2005. Anon., 2015 a, b.

Table 3 Meanings of Words Given by Groups of Engineering Students

Word	Category of Meaning	MN 1	MR 1	GM 1	GL 1	EL 1	MC 1	CE 1	MA 1	Total No. of Responses
		No.	No.	No.	No.	No.	No.	No.	No.	
Elevation	Scientific/Engineering (only)	2	0	0	10	11	0	3	6	**32**
	Normal (only)	18	34	35	29	20	32	38	20	**226**
	Both	2	1	0	4	0	0	1	0	**8**
	Nil	7	1	1	0	2	1	4	0	**16**
	Wrong	0	0	0	0	3	0	0	4	**7**
Total No. of Students		**29**	**36**	**36**	**43**	**36**	**33**	**46**	**30**	**289**
Surveying	Scientific/Engineering (only)	23	29	30	36	23	25	5	28	**199**
	Normal (only)	4	4	5	6	8	8	20	1	**56**
	Both	2	3	0	0	0	0	5	1	**11**
	Nil	0	0	1	0	1	0	15	0	**17**
	Wrong	0	0	0	1	4	0	1	0	**6**
Total No. of Students		**29**	**36**	**36**	**43**	**36**	**33**	**46**	**30**	**289**
Function	Scientific/Engineering (only)	0	0	2	6	18	0	14	11	**51**
	Normal (only)	29	36	31	35	15	30	28	18	**222**
	Both	0	0	0	2	0	1	1	0	**4**
	Nil	0	0	3	0	0	2	3	0	**8**
	Wrong	0	0	0	0	3	0	0	1	**4**
Total No. of Students		**29**	**36**	**36**	**43**	**36**	**33**	**46**	**30**	**289**
Sign	Scientific/Engineering (only)	7	9	6	7	11	10	16	11	**77**
	Normal (only)	19	21	28	32	21	20	25	18	**184**
	Both	2	6	1	3	1	0	0	0	**13**
	Nil	1	0	1	1	2	3	5	1	**14**
	Wrong	0	0	0	0	1	0	0	0	**1**
Total No. of Students		**29**	**36**	**36**	**43**	**36**	**33**	**46**	**30**	**289**
Model	Scientific/Engineering (only)	20	19	20	26	17	25	34	11	**172**
	Normal (only)	2	11	11	12	17	5	8	17	**83**
	Both	7	4	1	2	0	0	0	1	**15**
	Nil	0	2	4	1	1	3	4	1	**16**
	Wrong	0	0	0	2	1	0	0	0	**3**
Total No. of Students		**29**	**36**	**36**	**43**	**36**	**33**	**46**	**30**	**289**
Drive	Scientific/Engineering (only)	0	2	0	3	11	1	8	8	**33**
	Normal (only)	25	32	34	33	21	23	21	20	**209**
	Both	3	2	0	4	0	0	5	1	**15**
	Nil	1	0	2	0	3	7	12	1	**26**
	Wrong	0	0	0	3	1	2	0	0	**6**
Total No. of Students		**29**	**36**	**36**	**43**	**36**	**33**	**46**	**30**	**289**

Table 3 Meanings of Words Given by Groups of Engineering Students (Cont.)

Conductor	Scientific/Engineering (only)	6	7	7	13	21	10	12	8	**84**
	Normal (only)	14	26	22	22	13	15	25	17	**154**
	Both	8	3	2	6	0	1	2	2	**24**
	Nil	1	0	5	2	0	7	5	2	**22**
	Wrong	0	0	0	0	2	0	2	1	**5**
Total No. of Students		**29**	**36**	**36**	**43**	**36**	**33**	**46**	**30**	**289**
Power	Scientific/Engineering	8	10	9	7	21	9	14	6	**84**
	Normal	14	25	21	25	11	20	28	19	**163**
	Both	7	1	2	8	2	1	2	3	**26**
	Nil	0	0	4	3	2	3	2	2	**16**
	Wrong	0	0	0	0	0	0	0	0	**0**
Total No. of Students		**29**	**36**	**36**	**43**	**36**	**33**	**46**	**30**	**289**
Force	Scientific/Engineering (only)	17	18	20	16	27	9	21	18	**146**
	Normal (only)	7	11	7	16	6	17	20	9	**93**
	Both	5	5	0	7	2	3	1	2	**25**
	Nil	0	2	9	4	1	3	4	0	**23**
	Wrong	0	0	0	0	0	1	0	1	**2**
Total No. of Students		**29**	**36**	**36**	**43**	**36**	**33**	**46**	**30**	**289**
Stress	Scientific/Engineering (only)	2	4	14	3	0	3	12	6	**44**
	Normal (only)	18	30	16	33	0	22	30	19	**168**
	Both	2	2	1	3	0	0	0	2	**10**
	Nil	7	0	5	3	36	6	4	2	**63**
	Wrong	0	0	0	1	0	2	0	1	**4**
Total No. of Students		**29**	**36**	**36**	**43**	**36**	**33**	**46**	**30**	**289**
Spring	Scientific/Engineering (only)	1	2	1	9	24	2	9	7	**55**
	Normal (only)	18	30	26	25	8	23	20	10	**160**
	Both	3	1	0	4	1	1	1	2	**13**
	Nil	7	3	7	4	3	7	15	9	**55**
	Wrong	0	0	0	1	0	0	1	4	**6**
Total No. of Students		**29**	**36**	**34**	**43**	**36**	**33**	**46**	**32**	**289**
Shear	Scientific/Engineering (only)	1	4	1	4	12	3	2	4	**31**
	Normal (only)	16	20	18	18	0	20	18	10	**120**
	Both	2	1	2	0	0	10	0	0	**15**
	Nil	10	10	15	13	24	0	24	12	**108**
	Wrong	0	1	0	8	0	0	2	4	**15**
Total No. of Students		**29**	**36**	**36**	**43**	**36**	**33**	**46**	**30**	**289**

Table 4 Summary of Meanings of Words Given by Students

Meaning / Word	Scientific/Engineering (only)	Normal (only)	Both	Nil	Wrong	Total
Elevation	32	226	8	16	7	289
Surveying	199	56	11	17	6	289
Function	51	222	4	8	4	289
Sign	77	184	13	14	1	289
Model	172	83	15	16	3	289
Drive	33	209	15	26	6	289
Conductor	84	154	24	22	5	289
Power	84	163	26	16	0	289
Force	146	93	25	23	2	289
Stress	44	168	10	63	4	289
Spring	55	160	13	55	6	289
Shear	31	120	15	108	15	289
Total	**1008**	**1838**	**179**	**384**	**59**	**3468**

Table 5 Summary of the Results

Category of Meaning on the Students' Mind	No. of Students	Percentage of Students %
Scientific/Engineering (only)	84	29.07
Normal (only)	153	53.00
Both	15	5.16
Nil	32	11.07
Wrong	5	1.70
Total	**289**	**100**

Table 5 is a summary of the results which gives the overall picture and shows for each word, and from all the groups, the combined number of students out of the total of 289 students who wrote only the scientific/engineering meanings of some words; the combined number of students out of the total of 289 who wrote only the normal meanings of some words; the combined number of students out of the total of 289 who wrote both the scientific/ engineering meanings and the normal meanings of some words; the combined number of students out of the total of 289 who wrote nothing (nil) for some words; and the combined number of students out of the total of 289 who wrote wrong meanings of some words.

It is useful to explain here that the percentage and number of students in Table 5 were derived from Table 4 as follows: the percentage of students whose responses contained a meaning belonging to any category of meanings can be calculated as the number of responses in that category divided by the total number of responses and multiplied by 100. For example, the percentage of students who wrote only scientific/engineering meanings of some words is: 1008/3468 x 100 = 29.07%, which means that 29.07% of 289 equating to 84 students wrote only scientific/engineering meanings of some words.

3.2 Discussion

From Table 5, it becomes clear that, out of a total of 289 students, 84 (constituting 29.07%) gave only the scientific/engineering meanings of some words, indicating that they did not know the normal meanings of those words; and out of the 289 students, 153 (constituting 53.00%) gave only normal meanings of some words, indicating that they did not know the scientific/engineering meanings of those words. These students who gave either the scientific/engineering meanings only of some words or the normal meanings only of some words did not know both the scientific/engineering meanings and the normal meanings of those words and so cannot possibly switch to use the appropriate word if the context were given. Consequently, their reception and transmission of information may not be effective and clear.

Strangely enough, only a few students, just 15 out of the 289 students (constituting a mere 5.16%), gave both scientific/engineering meanings and normal meanings of some words, indicating that they knew both the scientific/engineering meanings and also the normal meanings and can possibly switch to use the appropriate word if the context were given.

Two more observations are made. First, out of the 289 students, some 32 (constituting 11.07%) gave no meanings to some words, indicating that they did not know some of the words at all, and that was a pity. Second, out of the 289 students, 5 (constituting 1.70%) gave meanings of some words that were totally wrong, indicating that they did not know those words; in fact, these students actually confused some of the words with others outside the list, notably *shear* with "shea" (as in "shea butter"), and "sheer" (mere) because they simply did not know. And that was worse.

The results went contrary to expectation because our argument was that the students would know both the scientific/engineering meanings and the normal meanings since, on the one hand, they were science and engineering students and, on the other hand, they had been users of the English language in school for, at least, 12 years since their Basic Education days (Basic School, 9 years; Senior High/Senior Secondary, 3 or 4 years and about 1 year in University). It is true that the students are only beginners being just First Year undergraduates. However, having done Science for three or so years in Senior High School and also done the first semester of university work when they had been introduced to the rudiments of the courses in their chosen engineering programmes, the students were expected to do better. Besides, as ordinary users of the English language and as would-be professional engineers, it was hoped that they had studied these words and others like them which they often encounter in their everyday lives and in their studies. Unfortunately, as can be observed, they did not meet expectation.

It would be observed then that the students have vocabulary challenges stemming from insufficient grasp of the semantic indicators of register, and the concepts relating to words and their meaning(s) generally, such as polysemy and homonymy.

4 Conclusions and Recommendations

The objective of this study had been to find out whether beginner science and engineering students at UMaT know both the scientific/engineering meanings and the normal meanings of the 12 selected words which they meet in their programmes of study and also in normal everyday English use.

From the study, it is concluded that the majority of the students know either the scientific/engineering meanings only of some of the words or the normal meanings only of some of the words. Only a few (5%) of the students know both the scientific/engineering and the normal meanings of some of the words. Therefore, the argument that they would know both has been disproved. To a large extent, the results show that there is a problem and the students are not sending and receiving information very correctly. There is therefore the need to remedy this poor state of affairs.

In finding a solution to the problem, we think that the students need to be firmly grounded in the semantic indicators of register, and the concepts relating to words and their meaning(s) generally. Concepts such as polysemy and homonymy should therefore be emphasised in the Communication Skills syllabus. The onus lies on their lecturers to make the students more aware of the English words with multiple meanings, and those that occur in the engineering disciplines as well as everyday normal discourse (of the students). Further research is also recommended to track the students and check the situation for improvement or otherwise as these students move on to Year 2, and Year 3 until they complete their courses of study. There is also work to do by the students themselves. Therefore, it is recommended that they should take time to read and improve upon their vocabulary.

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