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

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Mireku-Gyimah, P. B. (2017), "Revisiting the 'Duality of Meaning of some English Words: What's on the Minds of Mining and Related Engineering Students'", *Ghana Mining Journal,* Vol. 17, No. 2, pp. 78 - 88.

Abstract

A previous paper, published by me in 2015, studied the meanings of 12 English words, written by a group of first year students of University of Mines and Technology. The objective was to determine whether the students knew both the technical or scientific/engineering meanings and the normal meanings of the words, namely: *elevation, surveying, function, sign, model, drive, conductor, power, force, stress, spring,* and *shear.* A sample size of 289 students represented the group. The students willingly did a non-test exercise that permitted them to anonymously write the meanings of the words as they knew them without reference to dictionaries. The students' responses were put into five categories of meaning for each word. The results revealed that 84 (29.07%) provided only scientific/engineering meanings, 153 (53.00%) provided only normal meanings, 15 (5.16%) provided both scientific/engineering meanings and normal meanings, 32 (11.07%) provided no meanings (nil), and 5 (1.70%) provided wrong meanings of some words. Thus, the majority of the students did not know both meanings, which pointed to students' vocabulary challenges. This paper is revisiting the previous paper, to do a follow-up, using the same method and English words as in the previous study to find the progress of the same group of students who are now in their third year of study. From the current results, out of a total of 289 students, 48 (16.46%) gave only scientific/engineering meanings, 98 (33.94%) gave only normal meanings, 100 (34.69%) gave both scientific/engineering meanings and normal meanings, 39 (13.41%) gave no meanings (nil), and 4 (1.50%) gave wrong meanings, of some words. It is concluded that the students have made progress but there is more room for improvement. Therefore, it is recommended that the students work harder, and also be exposed to the register of their engineering disciplines early.

Keywords: Words, Duality of Meaning, First Year Students, Third Year Students

1 Introduction

Two years ago in 2015, I undertook a research in English register to find out "what's on the minds of Beginner Mining and Related Engineering Students" at the University of Mines and Technology (UMaT) when they hear some 12 words in English each of which has both a normal meaning, and a technical or scientific/engineering meaning – "duality of meaning". It was thus to discover whether the students knew both the scientific/engineering meanings and the normal meanings of the words, namely: *elevation, surveying, function, sign, model, drive, conductor, power, force, stress, spring,* and *shear.* For ease of reference to the theoretical framework underpinning the research, together with the hypothesis, I reproduce the literature reviewed and excerpts of the work by Mireku-Gyimah (2015). "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 commonly known. This is the normal 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

*Manuscript received July 15, 2017
Revised version accepted November 22, 2017
https://dx.doi.org/10.4314/gm.v17i2.10

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 relation between the speaker and the audience (interlocutors), and the topic under discussion. Three main elements which determine a speech situation can therefore be 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 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 'tear and wear'; 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.

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. But, 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" (Mireku-Gyimah, 2015).

The current paper, like the previous one, "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 may either confuse unfamiliar ordinary words which look like some other words that belong to the register of science and engineering and thereby misspell some words.

Again, this paper, like the earlier paper, investigates the duality of meaning of some 12 selected English words and what is actually on the mind of the beginner engineering student when he/she hears or uses these words, namely *elevation, surveying, function, sign, model, drive, conductor, power, force, stress, spring* and *shear*, 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 the engineering student tends 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 (see Mireku-Gyimah, 2015). The objective of this research is to discover whether our science and engineering students from nine out of the ten Departments/Programmes at UMaT as of 2015, have now come to "know the scientific/engineering meanings at the same time as the normal meanings of those words, which they meet in their programmes of study and also in everyday discourse", having successfully progressed from First Year to Third Year.

The current paper may appear to contain most of the write-up appearing in the previous paper published in 2015, but that should not be interpreted to be self-plagiarism because the current work is a repetition of the previous work, except that it is looking at the same group of students who are now in the third year of study. It is the difference in the results that is of interest. In such a situation, it is simply impossible and, in fact, not logical, to attempt to give a different write-up.

2 Resources and Methods Used

2.1 Population and Sample Size

The population for the study was the whole group of Third Year Students, who totalled 428. Out of this number, a sample size of 289 students representing the group participated in the study and, as in 2015, they happened to be students from the various Departments/Programmes of Engineering, who attended lectures and willingly did the "writing" exercise specially conducted for the purpose. The sample size of 289 as in the previous study was just coincidental. There were 30 out of 53 students from Mining (MN), 28 out of 36 from Mineral (MR), 23 out of 45 from Geomatic (GM), 23 out of 48 from Geological (GL), 47 out of 53 from Electrical and Electronics (EL), 36 out of 53 from Mechanical, 41 out of 52 from Computer Science and Engineering (CE), and 32 out of 51 from Environmental and Safety Engineering (ES). In addition were 29 out of 36 students from Mathematics (MA) Department/ Programme (as of 2015) (see Table 1).

2.2 Methods

As in the previous study, "the 'writing' exercise was not a test of any kind. Therefore, it was conducted in a relaxed manner and such that the students anonymously wrote all the meanings they naturally knew for each word. However, they were not allowed to make reference to dictionaries or seek any other help. They therefore took their time and provided as many different meanings "as they could and therefore really knew". The scripts were collected from each participant and sorted out, using dictionary meanings and meanings from other sources (see Table 2) as a guide for both the normal meanings and the technical or scientific/engineering meanings of the words. 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,

Table 1 Departments/Programmes and Participating Students

Department/Programme	Total No. of Students In Third Year (2017)	No. of Participating Students In Third Year (2017)
Mining Engineering (MN) III	53	30
Mineral Engineering (MR) III	36	28
Geomatic Engineering (GM) III	45	23
Geological Engineering (GL) III	48	23
Electrical and Electronics Engineering (EL) III	53	47
Mechanical Engineering (MC) III	53	36
Computer Science and Engineering (CE) III	53	41
Environmental and Safety Engineering (ES) III	51	32
Mathematics (MA) III	36	29
Grand Total	**428**	**289**

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*" (Mireku-Gyimah, 2015).

"The responses of the students were sorted out for each word and put into five categories of meaning, as appropriate, while taking into consideration the fact that some students wrote no meaning(s) at all for some words and others wrote wrong meaning(s) for some words. The five categories of meaning were the following:

(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))" (Mireku-Gyimah, 2015).

3 Results and Discussion

3.1 Results

"The detailed results of the current 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 participating students whose responses belonged to that category." For instance, the number of students in the Mining Engineering (MN III) Department/Programme is 30 (see Table 1). Hence, for *elevation*, the number of responses in each of the five categories: 2, 7, 20, 0, 1 sum up to be 30 which is also the number of participating students in MN III. 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 Table 4.

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" (Mireku-Gyimah, 2015).

Table 2 Words and Meanings

Word	Meaning	
Elevation	Normal	- the act of elevating or the state of being elevated - 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 - the angle formed between the muzzle of a gun and the horizontal
Surveying	Normal	- looking around to familiarise with something or a situation
	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 a testation 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
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
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 specific attitude or state - to cause to make
	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.
Conductor	Normal	- An official on a bus who collects fares - A person who conducts an orchestra - 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.

Table 2 (Cont'd) Words and Meanings

Word	Meaning	
Power	Normal	- the ability to do something - a specific ability, capacity, or faculty - political, financial, social etc. force of 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, liberty, or privilege - 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
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
Stress	Normal	- special emphasis or significance - 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
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
Shear	Normal	- to remove by cutting or clipping - to cut 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

"Sources: Anon., 1999, 2005. Anon., 2015 a, b." (See Mireku-Gyimah, 2015)

Table 3 Meanings of Words Given by Groups of Engineering Students

Word	Category of Meaning	MN III	MR III	GM III	GL III	EL III	MC III	CE III	MA III	ES III	Total No. of Responses
		No.	No.	No.	No.	No.	No.	No.	No.	No.	
Elevation	Scientific/Engineering (only)	2	6	8	4	5	5	4	0	9	43
	Normal (only)	7	8	0	1	20	12	22	14	9	93
	Both	20	14	15	18	22	18	13	13	14	147
	Nil	0	0	0	0	0	0	1	1	0	2
	Wrong	1	0	0	0	0	1	1	1	0	4
Total No. of Students		**30**	**28**	**23**	**23**	**47**	**36**	**41**	**29**	**32**	**289**
Surveying	Scientific/Engineering (only)	6	15	12	4	6	10	12	5	9	79
	Normal (only)	2	2	2	2	11	9	9	5	1	43
	Both	22	10	8	17	27	16	17	19	22	158
	Nil	0	1	1	0	3	1	2	0	0	8
	Wrong	0	0	0	0	0	0	1	0	0	1
Total No. of Students		**30**	**28**	**23**	**23**	**47**	**36**	**41**	**29**	**32**	**289**
Function	Scientific/Engineering (only)	1	1	0	2	3	6	2	3	0	18
	Normal (only)	21	17	13	14	32	21	19	17	23	177
	Both	7	9	5	7	10	7	17	5	5	72
	Nil	0	1	5	0	2	2	3	4	4	21
	Wrong	1	0	0	0	0	0	0	0	0	1
Total No. of Students		**30**	**28**	**23**	**23**	**47**	**36**	**41**	**29**	**32**	**289**
Sign	Scientific/Engineering (only)	1	1	7	1	0	5	7	2	5	29
	Normal (only)	16	17	8	10	30	21	16	15	13	146
	Both	10	9	6	12	16	7	17	6	9	92
	Nil	3	1	2	0	1	2	2	6	5	22
	Wrong	0	0	0	0	0	0	0	0	0	0
Total No. of Students		**30**	**28**	**23**	**23**	**47**	**36**	**29**	**29**	**32**	**289**
Model	Scientific/Engineering (only)	1	3	5	2	4	5	13	5	1	39
	Normal (only)	15	11	13	7	31	13	9	10	14	123
	Both	10	9	4	13	9	13	14	10	13	95
	Nil	4	5	1	1	3	5	4	4	4	31
	Wrong	0	0	0	0	0	0	1	0	0	1
Total No. of Students		**30**	**28**	**23**	**32**	**47**	**36**	**41**	**29**	**32**	**289**
Drive	Scientific/Engineering (only)	1	2	4	1	3	4	4	0	2	21
	Normal (only)	8	15	13	9	24	21	24	15	15	144
	Both	15	9	0	11	17	9	11	9	10	91
	Nil	6	2	0	1	3	2	1	5	5	25
	Wrong	0	0	6	1	0	0	1	0	0	8
Total No. of Students		**30**	**28**	**23**	**23**	**47**	**36**	**41**	**29**	**32**	**289**

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

Word	Category of Meaning	MN III	MR III	GM III	GL III	EL III	MC III	CE III	MA III	ES III	Total No. of Responses
		No.	No.	No.	No.	No.	No.	No.	No.	No.	
Conductor	Scientific/Engineering (only)	5	2	4	5	9	13	6	5	2	51
	Normal (only)	5	16	10	3	6	10	14	12	10	86
	Both	12	9	3	14	27	10	16	8	16	115
	Nil	8	1	6	1	5	3	5	4	3	36
	Wrong	0	0	0	0	0	0	0	0	1	1
Total No. of Students		**30**	**28**	**23**	**23**	**47**	36	**41**	**29**	**32**	**289**
Power	Scientific/Engineering	7	5	1	1	2	9	9	2	2	38
	Normal	9	15	7	7	16	10	13	17	12	106
	Both	11	8	12	12	26	12	18	6	7	112
	Nil	3	0	3	3	3	5	1	4	10	32
	Wrong	0	0	0	0	0	0	0	0	1	1
Total No. of Students		**30**	**28**	**23**	**23**	**47**	36	**41**	**29**	**32**	**289**
Force	Scientific/Engineering (only)	5	10	6	6	11	14	11	10	7	80
	Normal (only)	5	2	5	5	11	1	11	3	2	45
	Both	12	10	9	9	20	15	14	8	17	114
	Nil	7	6	3	3	5	6	5	7	4	46
	Wrong	1	0	0	0	0	0	0	1	2	4
Total No. of Students		**30**	**28**	**23**	**23**	**47**	36	**41**	**29**	**32**	**289**
Stress	Scientific/Engineering (only)	4	6	3	3	9	10	6	8	3	52
	Normal (only)	8	6	6	6	14	6	16	13	6	81
	Both	7	9	9	9	15	15	11	8	15	98
	Nil	11	7	5	5	7	5	8	0	8	56
	Wrong	0	0	0	0	2	0	0	0	0	2
Total No. of Students		**30**	**28**	**23**	**23**	**47**	36	**41**	**29**	**32**	**289**
Spring	Scientific/Engineering (only)	5	3	1	1	8	10	6	4	0	38
	Normal (only)	6	7	15	15	16	6	11	11	11	98
	Both	10	9	3	3	14	8	11	2	8	68
	Nil	9	9	3	3	9	11	13	11	13	81
	Wrong	0	0	1	1	0	1	0	1	0	4
Total No. of Students		**30**	**28**	**23**	**23**	**47**	36	**41**	**29**	**32**	**289**
Shear	Scientific/Engineering (only)	7	9	9	9	12	18	8	2	9	83
	Normal (only)	2	0	0	0	6	7	7	7	6	35
	Both	6	4	7	7	4	2	7	1	3	41
	Nil	13	13	6	6	21	5	19	10	12	105
	Wrong	2	1	1	1	4	4	0	10	2	25
Total No. of Students		**30**	**28**	**23**	**23**	**47**	36	**41**	**29**	**32**	**289**

Table 4 Summary of Meanings of Words Given by Students

Word	Categories of Meaning					
	Scientific/Engineering (only)	Normal (only)	Both	Wrong	Nil	Total
Elevation	43	93	147	4	2	289
Surveying	79	43	158	1	8	289
Function	18	177	72	1	21	289
Sign	29	146	92	0	22	289
Model	39	123	95	1	31	289
Drive	21	144	91	8	25	289
Conductor	51	86	115	1	36	289
Power	38	106	112	1	32	289
Force	80	45	114	4	46	289
Stress	52	81	98	2	56	289
Spring	38	98	68	4	81	289
Shear	83	35	41	25	105	289
Total	**571**	**1177**	**1203**	**52**	**465**	**3468**

"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" (Mireku-Gyimah, 2015). "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: (571/3468) x 100% = 16.46%, which means that 16.46% of 289 equating to 48 students "wrote only scientific/engineering meanings of some words".

Table 5 Summary of the Results

Category of Meaning on the Students' Mind	No. of Students	Percentage of Students %
Scientific/Engineering (only)	48	16.46
Normal (only)	98	33.94
Both	100	34.69
Nil	39	13.41
Wrong	4	1.50
Total	**289**	**100**

3.2 Discussion

3.2.1 The Current Results

From Table 5, it is clear that out of the 289 students, 48 (constituting 16.46%) provided only scientific/engineering meanings of some words, 98 (constituting 16.46%) provided only normal meanings of some words, 100 (constituting 33.94%) provided both scientific/engineering meanings and normal meanings of some words, 39 (constituting 13.41%) provided no meanings (nil) of some words, and 4 (constituting 1.50%) provided wrong meanings of some words.

From the above stated results, it could be observed that the 100 out of the 289 students formed those out of the group who could actually be counted on to know and, therefore, to have the ability to use the selected English words correctly in both the technical or scientific/engineering sense and the normal sense. These then are the ones who, we could say, do not have vocabulary problems and can "possibly switch to use the appropriate word" in their communication "if the context were given" (Mireku-Gyimah, 2015).

3.2.2 Comparison of Current and Previous Results

The objective of this paper was set to investigate if the students, now in the Third Year of their study, know both scientific/technical and the normal meanings of the words. To do this, the results of the current study are compared with those of the previous study undertaken in 2015.

Table 6 shows the results of the study in 2015 when the students were in the First Year and in 2017 when the students have progressed to the Third Year. The following observations are clear:

(i) The number of students who knew only the scientific/engineering meaning of some words in 2015 when they were in their first year of study (84) has decreased to 48 in 2017 when they are in their third year of study. The difference of 36 shows the additional number of students who have also come to know both the scientific/engineering and the normal meanings of some words, which is an improvement.

(ii) The number of students who know only the normal meanings of some words in 2015 when they were in their first year of study (153) has decreased to 98 when they are in their third year of study. The difference of 55 shows the additional number of students who have also come to know both the scientific/engineering and normal meanings of some words, which is also an improvement.

(iii) The number of students who gave the wrong meanings of some words in 2015 when they were in their first year of study (5) has decreased to 4 when they are in their third year of study. The difference of 1 shows that one additional student has come to know the correct meanings of some words, which is also an improvement.

(iv) The number of students who did not know any meaning of some words in 2015 when they were in the first year of their study (32) has increased to 39 when they are in their third year of study. The difference of 7 shows the additional number of students who now do not know any meanings of some words but knew the meaning of the words two years ago, which is very strange. The plausible reason for this anomaly could be that these students simply did not write any meaning of some words.

The number of students who knew both the scientific/engineering and the normal meanings of some words in 2015 when they were in their first year of study (15 constituting 5.19%) has increased to 100 (constituting 34.69%) in 2017 when they are in their third year of study. The difference of 85 shows the additional number of students who have come to know both the scientific/engineering and the normal meanings of some words, which is an appreciable improvement. This improvement is due to the decrease in the number of students who, in 2015, knew only the scientific/engineering meanings or only the normal meanings or the wrong meanings of some words, offset by the number of students who, in 2017, could not write any meaning(s) for some words. Although it is an interesting finding that there has been a marked improvement, it could still be argued that the "marked improvement" is below expectation, so the best from the students was not good enough since only 100, forming less than half their total number (i.e. 289) know both meanings of the words.

4 Conclusions and Recommendations

4.1 Conclusions

The aim of this paper has been to revisit my previous paper (2015) as a follow-up to track the progress of Third Year students, specifically to find out whether two years on as science and engineering students at UMaT, the same crop of students who were beginners in 2015 and undertook the exercise have improved and now come to know both the scientific/engineering meanings and the normal meanings of the selected words which they meet in their programmes of study and also in normal everyday English use.

Table 6 Summary of the Results (2015 and 2017 Compared)

Category of Meaning on the Students' Mind	No. of Students		Percentage of Students %	
	(2015[I])	(2017[III])	(2015[I])	(2017[III])
Scientific/Engineering (only)	84	48	29.07	16.46
Normal (only)	153	98	53.00	33.94
Both	15	100	5.19	34.69
Nil	32	39	11.07	13.41
Wrong	5	4	1.73	1.50
Total	**289**	**289**	**100**	**100**

The results of the previous study showed that out of the total number of 289 students, only 15 (5.17%) knew both the scientific/engineering meanings and the normal meanings of the selected words in 2015, when they were in their first year of study. In 2017, the same number of 289 students is in their third year of study and 100 (34.69%) of them know both the scientific/engineering meanings and the normal meanings of the same selected words. It can therefore be concluded that, in 2017, out of this same crop of students, the number who have also come to know both the scientific/engineering meanings and the normal meanings of the selected words is 85, which is nearly six (6) times the number who knew both meanings in 2015. Clearly, over the three years of their study, there has been a marked improvement in the knowledge of the students about the duality of meaning of the selected words. However, judging from the fact that, out of the 289 students in their third year of study, only 100 (34.69%) constituting less than half of them know both meanings of the words, there is much more room for improvement.

4.2 Recommendations

We repeat our recommendations that: "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"; and, "polysemy and homonymy should be emphasised in the Communication Skills syllabus". We also recommend that the students be exposed to the register of their engineering disciplines much earlier. Hopefully, the students' knowledge would be good by the time they complete their programmes of study.

Acknowledgements

I would like, once again, to express deepest appreciation to all who participated and contributed in diverse ways to the success of this study, especially all the students who gave the meanings of the words in 2015 and also in 2017. I wish them well as I also advise them to work harder.

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