USING SPECIFIC TECHNICAL VISUALS IN THE LANGUAGE CLASS

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Abstract

The characteristics of technical discourses imply an abundance of visual elements. From charts to diagrams and from graphs to technical drawings, the technical communication is overwhelmingly dependent on visuals. For engineering students, a good mastery of the English technical language inevitably implies a good command of the most common language structures used to describe the above-mentioned elements. For an English language instructor, this requirement implies the need to update courses, seminars and other language learning-related activities with information related to describing specific technical visuals.

Keywords: technical language, describing graphs, visual elements, language functions, trends, technical communication.

Visual elements such as graphs, tables, charts, diagrams, figures etc. are characteristic for the field of engineering. The characteristics of technical discourses imply an abundance of visual elements. From charts to diagrams and from graphs to technical drawings, the technical communication is overwhelmingly dependent on visuals. This mode of presenting technical information is very common in oral presentations, but also in written documents. They constitute one of the most frequently met models of transmitting messages, because the specificity of the technical messages relies on facts, figures and numbers which can be easily presented in visual form. For engineering students, a good mastery of the English technical language inevitably implies a good command of the most common language structures used to describe the above-mentioned elements. For an English language instructor, this requirement implies the need to update courses, seminars and other language learning-related activities with information related to describing specific technical visuals.

The objectives of this paper are related to the importance of this specific language element for both students and teachers in the context of learning/teaching English as a foreign language in a technical academic environment. The paper aims to revise the most common forms of visual elements in an engineering context and explain the practical importance of including them into the language class, suggest a series of language elements required to perform language transfer and design practical activities of introducing them into the teaching process.

The concepts of "visual language" and "visual rhetoric" must be approached when dealing with the importance of visual elements in an engineer's work. If we consider technical communication as part of the broader domain of general human communication, then one of its key constituents would be visual language, conceived as a system of communication based on visual elements. This is explained by the nature of the technical discourse, which implies the resort to such elements as charts, tables, graphs,

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diagrams and other such figures to convey information. On the other hand, communication, either written or spoken, should not exclude the visual element as an extension meant to describe the perception, understanding and production of visual elements (Cherry 1978).

The importance of visual elements in technical writing is acknowledged by Paul Anderson who, in Technical Communication: a Reader-Centered Approach states that "in communications written at work, tables, charts, drawings, photographs and other graphics are often as important as written text (Anderson 1999).

In this respect, the mastery of visual rhetoric is essential for the proper understanding and efficient production of this specific language system. In order to be successful in using visual language, one needs to be visually literate, a quality which has long been considered one of engineers' foremost qualities even in the lack of theoretical considerations on the topic. However, there have been recent attempts to theorize visual literacy, such as the definition given by Purdue OWL, which labels this concept as "one's ability to read an image", to "understand what an image is attempting to communicate", which includes understanding "creative choices made with the image such as coloring, shading, and object placement" (Visual).

A successful engineer should make efficient use of visual language elements and of visual rhetoric in order to communicate technical information in an adequate manner. A series of elements can be represented by using visuals, among which: real things (objects), numbers, instructions, descriptions – all of them being specific elements for technical writing. There is a whole range of visual elements which can make technical communication more direct, therefore more efficient and more easy-to-understand. Among these, some of the most common ones are graphs, tables and diagrams.

1. Graphs are not specific engineering visual aids, but when adapted, they are perfectly suitable to convey technical information. There are several types of graphs that students can choose to present the results of their work in an easily understandable, logical and organized manner. Creating graphs is an important communications skill for all engineers and students, and so is the ability to choose between these different types. Graphs are practical ways of achieving several purposes, among which: allowing visualization of large data sets, showing trends in data, showing cause-and-effect relationships, making comparisons, making predictions etc.

The language class for engineering students can use different types of graphs in order to practise various language structures. The most common types of graphs are: line graphs (figure 1) which compare two variables plotted along an axis, bar graphs (figure 2) which are graphical displays of data using rectangular bars of different heights, proportional to the values that they represent, and pie graphs (figure 3) which are circular charts divided into sectors, illustrating numerical proportion.

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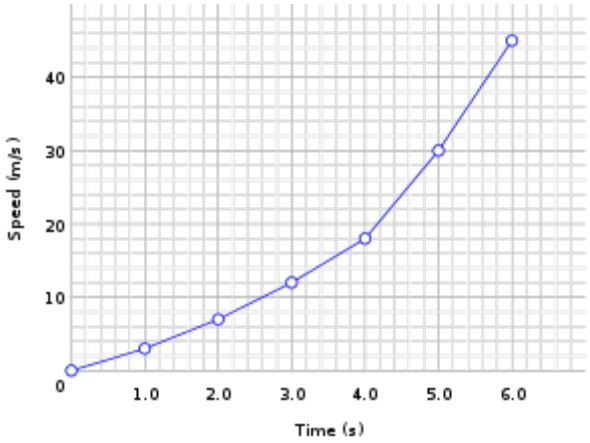

Figure 1: Example of line graph

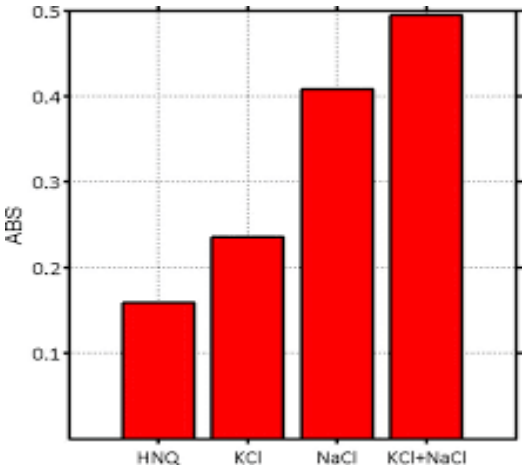

Figure 2: Example of bar graph

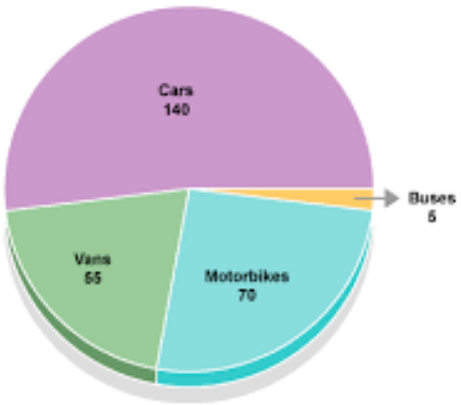

Figure 3: Example of pie graph

The main features of these graphs are meant to facilitate technical communication by showing trends in data clearly, by showing specific values of data, by allowing side-by-side comparisons between data sets, by showing the interdependence between variables, by allowing readers / public to make predictions about the results. The practical uses of line graphs allow the language instructor to design activities practising a series of language items such as: language for describing things, language for comparison, language for predictions, collocations, describing trends etc.

2. Tables are used when the technical message is restricted to mainly numbers and they are efficient means of presenting numerical data. Their main advantage is the rapid access to information and comparison of elements. In the language class, the description of tables mainly involves such linguistic categories as comparison of adjectives, describing specifications (height, depth, length, weight) and physical characteristics.

Language regarding table elements, such as: "rows", "columns", "column heading", "row heading", "column or row subheading" may be acquired, practiced and produced in a variety of activities. Also, tables may be used in the language class as a means of practising language functions as comparing and contrasting trends/phenomena/objects.

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3. Diagrams are a type of technical drawing used to define in a clear manner different engineering items. They are meant to communicate characteristics and special features of different engineering mechanisms, devices, systems and processes by using a universal system of symbols that indicate different engineering parts.

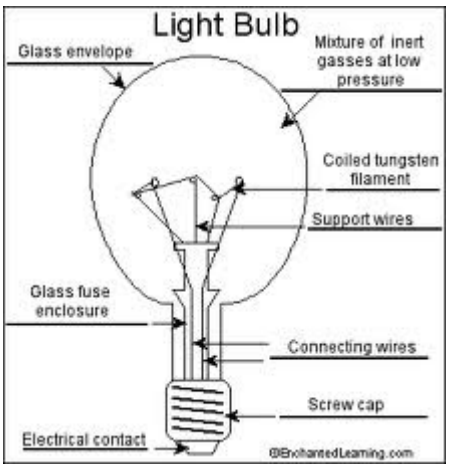

Figure 4: Example of diagram. Source: http://www.nomenclaturo.com/electric-electricity

Diagrams are highly productive aids in teaching English for Engineering students, for a variety of purposes. They are extremely versatile in terms of the variety of language elements which can be practiced while using them, from specific technical vocabulary to grammatical categories and a diversity of language functions. They can be used to describe processes and phenomena, to describe change, to explain instructions and work operations, to refer to product specifications and compare measures. The choice of diagrams should reflect students' professional interest and should activate vocabulary and knowledge in students' native language so as to create motivation and facilitate learning.

Language activities which can be implemented in the English for engineering class should start from basic tasks such as labeling the parts of a graph/table/diagram to more complex requirements such as interpreting figures and comparing trends in written form. An example of a basic task would be the following: students are given handouts containing a visual element (graph, table, diagram or of another type) whose parts are not labeled. They have to select from a series of parts and correctly label each element on their handout. Some typical examples of parts may include the following terms: "caption", "horizontal axis", "vertical axis", "rows", "columns", "column heading", "row heading", "column or row subheading" etc.

Once the specific terminology has been acquired, another possible activity may aim to check students' understanding of the visual information. Students are presented with different types of visuals followed by a series of both true and false statements related to them. The statements may refer to describing trends or proportions in a graph or to percentages and sizes from a table as well as to process sequences illustrated in a diagram. Students will have to prove correct understanding of the visual by deciding whether the statements are true or false.

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An example of intermediate-level activity is a sample of guided writing. Students are required to fill in a text describing the information contained in a graph/table/diagram either by selecting from a choice of items (multiple choice) or by choosing a word which best fits the space (cloze exercise).

For more advanced levels, language instructors may design free writing activities with an input material under the form of visual elements. In recognition of the practical importance of this type of language learning activities, they are currently included as requirements for passing popular language certification examinations such as IELTS. These tests include an information transfer task in relation to the factual content of various visual elements (most commonly tables, graphs or diagrams). Students may be asked to describe information given in different visual inputs, describe a process shown in a diagram or compare statistical figures or trends. The language instructor can use an increasingly wider selection of resources providing different types of exercises which prepare students to pass language tests and expand their knowledge in terms of describing visual elements.

The language which is generally the focus of such activities refers to the words and phrases used when describing the information contained in these visuals. The typical information included on visuals usually refers to a series of categories such as: age (how old), weight (how heavy), height (how tall), date (which day, month, year, etc.), time (how much time is required), length (how long), width (how wide), degrees (how hot or cold), percentage, number, duration (length of time required).

There are various specific purposes for using visuals, each of them having specific vocabulary with which the students should become familiar.

Here is a selection of the most common ones, together with some vocabulary which may form the objective of activities in the language class:

- Describing positive trends: to climb – a climb, to ascend – an ascent, to rise- a rise, to improve – an improvement, to recover – a recovery, to increase – an increase, an upward trend, to peak – a peak, to go up.
- Describing negative trends: to fall – a fall, to decline – a decline, to worsen – a slip, to decrease- a decrease, to drop – a drop, a downward trend, to go down.
- Predicting future change: to project –projection, to forecast – forecast, to predict – prediction.
- Describing constancy: to level out, to remain stable, to remain steady, to stay constant, to maintain the same level.
- Describing the size and speed of the trend: dramatic – dramatically, sharp – sharply, huge – hugely, enormous – enormously, steep – steeply, substantial – substantially, considerable – considerably, significant – significantly, marked – markedly, moderate – moderately, slight – slightly, minimal – minimally, rapid – rapidly, sudden – suddenly, steady – steadily, gradual – gradually, slow – slowly.

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Teaching English with a Purpose – apart from the general purpose of knowing the language – implies the acknowledgment by the teacher of the particularities of certain types of discourses. When the context is technical English, perhaps more than in the case of other specialized discourses, one can never neglect the importance of visual elements. Using them as a basic material of the teaching process, introducing language structures via specific engineering visuals is likely to increase student motivation, fostering student participation and involvement and increasing the chances of a successful language acquisition process.

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