Abstract: - The present research displays types of academic technical writing implemented in the Faculty of Power Engineering from the Polytechnic University of Bucharest during foreign language course&seminars, together with statistics proving students’ results and the effectiveness of the approach over a learning cycle of four years. There is a wide range of academic writing formats, covering a diverse area, from scientific reports to political&policy essays, paying special attention to the editing process of student formal technical writing, a must in the progress towards efficiency nowadays. Apart from presenting templates and didactic instructions, this article also deals with proofreading, peer reviewing, professors’ instructions and rigor in obeying internationally accepted citation formats, in order to avoid plagiarism and cheating in academic environments.

Key-Words: - deductive compositions, technical and lab reports, process analysis texts, company manuals, research essays, case studies, editing personal academic writing in engineering, foreign language competence

1 Introduction

Ever wider and increasingly complex communication nowadays in the fields of research, practical engineering and management of multinational work force calls for periodical reform & updates in course content & didactic approaches throughout university studies. In this context, foreign language professors face significant responsibility, duties, and challenges.

2 Problem Formulation

In order to pursue active and successful careers, the new generations of learners in engineering face the demands of reading, researching and accessing documentation for their studies from diverse sources worldwide, and should become able to express their views and original contributions to science, technology and actual work as soon as possible, via both written & oral channels, of which the most problematic seem to be the written ones.

3 Problem Solution

As a solution to this problem, I investigated the main writing patterns in engineering education and post-graduate activity, I listed their key features with certain didactic suggestions that seemed relevant to me at the moment of teaching, and I also computed the compliance and success rates from the final writing products my students achieved in a study cycle of 4 years. Information & statistics are shown below.

3.1 Deductive Essays

Drafting them involves deductive reasoning in order to draw a conclusion&guide the reader through the process implemented in attaining it. Therefore, the writing activity and its structure mirror the flow of deductions and take into account certain circumstances or clues to develop an assumption. There are three basic components to deductive reasoning: the premise, the evidence, and the conclusion. The basic premise is based on factual information while the evidence assists in drawing the conclusion. There are several potential conclusions, and it is best to focus composition on the one that makes the most sense, even if several possible explanations may still exist. Debating all potential conclusions makes the essay lose focus & impact. The key to presenting a strong argument is to present solid evidence to support the deduction. This information is fact-based, relying on meaningful support taken from any relevant source, including the personal experience. As with any text, the deductive composition possesses a strong introduction and conclusion. They focus attention on key aspects and briefly state the main message. The body of the essay explains the thinking stages that led to that conclusion, including the decisive evidence, while the summary will restate the author’s position and summarize the deduction that has been made.
3.2 Technical or Scientific Reports

The text must be concise and clear in conveying technical data to the reader, since its main purpose is to share information. It should also be easy to understand, entertaining and stimulating, so that the targeted audience will not be bored while reading it. However, the informative message gets top priority. In order to guarantee quality, intense planning needs to precede composing, in a pre-writing stage, which includes: formulating the title, prioritizing key ideas, and arranging facts in logical order, so as to enable readers to scan through the report if necessary. The most important facts are placed at the beginning, to convey the main ideas within just a few minutes’ reading. Defining the readership is just as important as the title, because audiences’ levels determine the amount of explanation to be provided. The length of the document depends on its destination, and it is actually more difficult to draft a short report than a long one, since increased synthesis and organization are implied in concise writing. The conclusion answers the questions posed in the introduction. Each section, including the introduction & the conclusion, should be numbered. Throughout the body the author often refers to the work that has been completed by other individuals in the field. The style is formal in nature and impersonal in language. All factual data, materials and measurements mentioned within this document must be kept separate from interpretations and opinions presented in the report. All sources must be properly cited. Grammar & punctuation mistakes, as well as errors in logic and flow could have a catastrophic impact on meaning, often distorting it beyond recognition.

Pattern compliance 83%. Success rate 71%

3.3 Laboratory Reports

Many formatting issues must be obeyed, according to the professor’s guidelines. Most of them contain the following elements:
• Cover page
• Title
• Purpose
• Equipment and Materials
• Procedure
• Results and Discussions
• Conclusions
• References

The cover displays few basic pieces of information: report title, author’s name, submission date. The title must be brief, yet descriptive, placed at the top. The statement of purpose follows, presenting reasons for performing the experiment, the possible gains, and the specific skills to be developed. Equipment and materials used are shown in list format, enabling a quick scan. A brief procedure description follows, including sufficient details to ensure clear perception of the steps leading to the conclusion. Irrelevant details are avoided. Next comes an outline of the results, accompanied by discussions in a separate section, on basis of all quantitative and qualitative observations. Quantitative data are best illustrated by tables & graphs, accompanied by captions explaining the information presented. This section also includes an interpretation of personal results & observations, thus answering the questions posed throughout the report. The conclusion explains why the results are significant and adds a summary of the author’s ideas regarding the experiment & its results. All reference materials used in the development of the lab report must be properly cited, according to the international formats and standards. The style should be straightforward and to-the-point in regard to the information presented, and the text should simply explain the scientific process, as well as the results, but should not include personal opinions on the experiment.

Pattern compliance 92%. Success rate 87%

3.4 Technical Essays

They are drafted for science-oriented courses, and require students to understand the functioning of particular mechanisms and approaches; in addition, learners must demonstrate the ability of looking at the topic subjectively, because technical essays combine hard facts with a viewpoint. Traditionally, they are informal academic documents allowing students to express their opinions or points of view on a topic. They are short academic assignments and may be required for any course. The style is direct and factual, avoiding impressionistic adjectives. In composing such texts, students begin by learning as much as possible about the issue, ensuring adequate and detailed understanding of each step. In technical essays authors do not merely enumerate action steps; they also explain why and highlight the significance. Characteristic elements of technical essays:
• providing an opinion or point of view on a topic
• giving instructions
• featuring an in-depth explanation of a topic
• describing the context of that topic.
• supporting material (guidelines & instructions).

Pattern compliance 69%. Success rate 58%

3.5 Technology Essays

These brief texts focus on a particular aspect, practice, or implication of technology. Professors give them as homework for the purpose of exploring scientific components, theories, and moral or societal
implications of technology. The variety of objectives generates a variety of approaches: science-oriented writing focuses on observable, practical aspects; theoretical or society-oriented texts explore general meanings of technology and its effects on human populations and interactions. These essays cannot assume the tone or objective of research papers, as they are not written with the primary intent of informing the reader about the subject through the presentation of a variety of scholarly opinions, but they are devised for exploring a subject from its author’s perspective. The informative component in such texts is non-neutral, as they admit the writer’s biased perspective from the very beginning. Credibility springs from thorough understanding of mechanisms, approach documentation, and clear vision regarding the impact of technology on life. The explanatory style should be clear and specific, accessible to informed laymen. Thorough scientific knowledge is articulated within a framework of concepts motivating why that specific technology is worth discussing and implementing. In other words, the writer must explain why the issue deserves to be investigated and applied. As already mentioned, this composition expresses an individual point of view, rigorously defined throughout the text by asserting the opinion in the thesis and then making points that relate to that statement throughout the text.

Pattern compliance 86%. Success rate 79%

3.6 Process Analysis Essays

The main objective is to write about a series of actions leading to a planned, expected outcome, with the purpose to explain, inform, or analyze. The first format strives to direct/instruct; the second explains or analyzes. In both cases, the essay guides readers on modalities to perform an action. The text should serve to clarify the steps that need to be taken in certain procedures; therefore, the style must be clear and meticulous, so that the audience could recreate the steps described. When explaining or analyzing, the purpose is to demonstrate how events happened, how devices work, or how a target was achieved, without necessarily asking readers to recreate the process. In planning the composition, the first step is to consider the audience for determining which information can be omitted and which must be included. If in doubt, the author should assume that the public has little knowledge about the topic within the general framework the author shares. Procedure steps are mentioned in chronological order, pointing to its logical contribution to the outcome. In fact, the only documents where the author can break away from writing in chronological order are the ones giving advice, providing words of caution, or define unfamiliar terms. The introductory paragraph has the thesis statement (merely informing on the topic) and an explanation why readers should be interested in learning more about that process. The body consists of the actual steps to follow, not written in list form or as an outline. The conclusion revisits the topic and summarizes the importance of understanding the process that was described.

Pattern compliance 53%. Success rate 51%

3.7 Process Essays

The purpose is to describe how things are done, so, first a process is selected and its importance to target audiences is determined, then what and whom it affects is mentioned. Precise understanding of all steps within the process is paramount, and other possible methods of completion could be considered. Selection favors the most easily comprehensible one. Background information & difficult terms definitions may be provided if presenting confusing or intricate processes. Similarly, any piece of equipment used in the process is depicted in detail. The introduction informs on the process & its relevance, motivating the readership to follow the next data. In the subsequent paragraphs, all stages are described in chronological order, pointing to their contribution and importance in the global scheme. Problems occurring in certain steps and ways to handle them are also shown. Many transitional phrases signaling passage from one step to the next will be implemented:

Pattern compliance 75%. Success rate 71%
3.8 Company Manuals
This type of formal writing provides employees with detailed information on company strategies and expected standards. Company policies rely on:
- current legislation in the field
- national, regional & international standards
- experience of similar companies
- corporate attorneys or other legal advisors
- modern templates of industrial & legal documents

The company manual has the following data:
- attendance and tardy policies
- dress code
- safety policies
- drugs and alcohol
- legal information (harassment policies)

The amount of detail included in company handbooks depends on employers’ preferences: for a zero tolerance policy on attendance, disciplinary actions taken for absence will all be specified: for flexible approaches, a case-by-case analysis will be enforced, without specifics in the manual.

In modern times when employees are suing their employers on a regular basis, many companies have chosen to implement zero tolerance policies that are clearly formulated, so as to prove that employees had previously been informed & instructed on such issues.

The layout displays subheadings, bullets, font variations and bold prints or larger fonts, in order to enable the employees to quickly skim through the company manual to find the section that deals with the information they seek. Bullets help scanning the text and highlight the most important parts. The list format focuses attention, delineates stages, and prevents the waste of time, as employees understand and easily interpret the data contained therein. This rigid format helps spotting loopholes & contradicting statements, facilitating their elimination from the early drafting stages. A company manual possesses legal value and employees can use it against employers if important data have been left out.

Pattern compliance 61%. Success rate 54%

3.9 Case Studies
Such documents describe how a situation was identified and how a solution was chosen for solving the problem, with a summary of study results showing the degree of success attained by that treatment method. Such formal texts assist others in a similar situation to determine whether the same method is a good option. They apply to any field: business, marketing, public administration, medicine, IT, or psychology. In dimensions, the texts are short, yet detailed, and do not include opinions, but provide factual information on the event. The text includes 3 sections: problem, treatment, and results. Problem presentation focuses readers’ attention by pointing to its meaning and impact. The more specific the issue being addressed, the more relevant & respected the results are likely to be. After detailing the topic, the composition discusses approaching modes, among which special attention is paid to detailing specific behavior modification strategies. Gathering vast amounts of data before implementing the treatment, as well as afterwards, is implicit, in order to compare the two instances, illustrating the differences by graphs or other visual representations of the newly acquired information. Furthermore, all information must be measurable and observable. Businesses do not work on study cases in order to sell certain forms of treatment, but they use such documents as a means of proving that their products or services are effective. All paragraphs are factual: case studies present facts in a measurable way, with a description of the problem and specifics on how it is dealt with, accompanied by detailed data on treatment effects.

Pattern compliance 97%. Success rate 95%

3.10 Research Essays
Such compositions are written on interesting and challenging topics. The author has the freedom to further narrow down the specific area to one that more relevant to tackle. The conceptual substance is not very technical in nature, since this type of essay avoids too specialized subjects. Title selection is performed according to the variety & amount of reliable sources available for research in books, almanacs, encyclopedias, professional journals, newspapers and magazines, or on the Internet. Searching for online data is particularly tricky, as websites can spread false information. Addresses with edu (educational institutions), gov (government institutions), and org (non-profit organizations) provide best documents. The introduction states the topic, the thesis, and outlines the succession of main ideas. Each of the next paragraphs begins by a topic sentence providing support for the thesis & detailed arguments to further illustrate it. Using different words, the conclusion restates the thesis & summarizes the key points. Proofreading eliminates grammar & punctuation errors and corrects logical flaws, making paragraph transitions smooth and sensible.

Pattern compliance 83%. Success rate 71%

3.11 Political & Policy Essays
They are brief texts commenting upon a specific political or policy (strategy) issue, theory, or practice, and are typically assigned as homework in political science or strategic management courses, but are
also popular in composition classes. Learners wrongly assume that political/policy essays are, by default, argumentative compositions, persuading the public to take sides; on the contrary, they are expository texts, or essays that seek to inform.

Strictly political writing never takes its substance from parties’ doctrine or positions regarding special issues, but focus on any issue, topic, theory, or practice that is related to government and to the culture of that government. Areas of interest:

- current prominent themes in the political discourse
- capital punishment
- environmental practices
- political ideologies
- leadership styles
- political rhetoric
- political negotiating
- government operation and citizens’ response
- governing styles for major world powers

These essays must anticipate the needs & issues the unsympathetic/uninterested/uninformed readers might pose and the topics they could contest/protest about. Strategies of coping with such questions result in a well-planned and multi-dimensional essay, two key features of any accomplished text.

Pattern compliance 62%. Success rate 57%

### 3.12 Editing

Editing the essay means ensuring proper grammar, adequate spelling and logical flow in ideas. It is crucial in attaining high standards. Professionals may assist in this activity, but it does not exempt authors from performing their own editing before submitting the homework for a grade. The process not only asks students to reflect on the essay and on addressing the thesis, but it also calls for a close inspection of each sentence and paragraph in the composition, to ensure that it is convincingly written and that it meets the assigned requirements. Under certain circumstances, the professional editor will have to review the initial project specifications, and occasionally rewrite parts of the essay, so as to fit the demands. Professionals often change sentences (word order, emphasis in formal style, elevated vocabulary, and technical jargon) so that the structure becomes stronger and able to communicate the message more effectively. As a result of editing, entire paragraphs may be moved or ideas may be rephrased. To make matters easier, essay outline editing before students start writing the composition should be the first step, addressing structure, content, and data flow. All learners should make sure that they leave enough time for extensive proofreading previous to submitting the essay for the grade. Many students will have already become familiar with essay proofreading by the time they enter college, as a result of extensive practice on a comprehensive range of such assignments during middle and high school English classes. However, not all authors are familiar with proofreading strategies.

The first thing students can do when they begin proofreading is to briefly review the entire composition in order to ensure that they understand the nature of the document. From there, they can review each sentence word-for-word. While proofreading, grammar & spelling corrections should be envisaged.

It may help learners to have another student or person read their essays. After all, numerous authors have been working for many hours, days, or even weeks on their essays, so they may not catch some of the grammatical errors that others may identify if they come to the essay with a fresh set of eyes. Also, if the author missed the mistake on the first review, then he/she may simply not be aware of the essay structure or spelling rules.

In general, it is advisable that students should spend significant time on essay proofreading prior to submitting the compositions for a grade. However, the length of the essay will determine how long it will take to review the essay. Students should not wait until the last minute before an assignment is due to write and review the essay, though.

Many authors benefit from printing their essays during the proofreading stages so that they might be able to make comments or corrections on paper. It is a well-known fact that writers spot more mistakes on paper than on the computer screen.

The difference between essay proofreading and essay editing should be familiar to students. Essay proofreading is designed to merely review grammar and spelling issues associated with an essay. On the other hand, essay editing may not only incorporate proofreading, but it may also include changing the structure and flow of the composition in order to improve the overall readability and quality of the text. Students may need one or both services prior to submitting the essay for a grade.

Essay editing is the final phase of the writing process in which the author refines style, readability, and presentation. Essay edits typically consist of multiple phases, as there are various levels of editing required for all final-stage texts. They definitely include proofreading – checking the document for spelling & grammar errors – but they go beyond it, because they involve a significantly deeper level of text alteration: issues of register, style, structure, and citation. An essay edit should be done after the writer has completed the second draft of the essay,
which means that all the basic sections are finished – introduction, body, conclusion – and the author has built the text sections conveying understandable, as well as well-developed points. The first step in this activity is the structural edit. In general, every essay has an introduction that presents a thesis statement, a development in which the thesis statement is defended and explored, and a conclusion where the thesis statement is commented upon in a new & insightful way. Learners usually admit that their compositions do not display the same smooth logical flow of ideas encountered in professional essays. Characteristic of student texts is an awkward structure, emerging from non-prioritized paragraphs, insufficiently planned structure, irrelevant arguments, and lack of transition sentences. Thus, when performing the structural edit, the student should carefully consider the main point of each paragraph and determine whether their order helps the reader best understand the objective of the text. As a general rule, the composition structure of an essay should progress in such a way that the best points are made towards the end, similar to the climax of a book or film. After performing structural edits, activity must continue with an excess edit, aimed at eliminating repetitive or unnecessary words, phrases, or paragraphs. If it seems that two paragraphs convey essentially the same idea, it is best to merge the best elements of those paragraphs together and then eliminate redundancy. After the excess edit, the author proceeds to a citation edit, examining all secondary sources cited, to determine whether they are properly documented according to the style sheet being used. The last step of an essay edit is proof-reading, which involves scouring the text for surface-level errors such as grammar & spelling mistakes and misused words. Knowing the public is another critical ingredient of good writing: assumptions and estimates are made on audiences’ level of knowledge in the field, to explain information for novice readers.

4 Conclusion

This study was a good instrument by means of which I was able to improve my work and provide students with most effective & clear guidelines. Moreover, it offered me the opportunity to compare success rates among students from various universities, and, as well as this, perform certain inter-disciplinary and trans-disciplinary research.

References:
9. Rossmer, R., Bolitho, R., Currents of Change in English Language Teaching, OUP, 1990
15. Wright, A, Roles of Teachers and Learners, Oxford University Press, 1997