Abstract

This is the third-paper, in-tetrology on the Scientific Research, Writing and Dissemination. Writing is a-universal-type of formal-scientific-communication, and yet, academics/researchers/scientists have a-rather dreadful-reputation, for being un-interesting, monotonous and, even, pathetically ‘dry’ writers. One-reason, behind-that, could-be, that majority of scientists are not, really, trained-writers. Moreover, pressure to-publish, poorly-prepared-manuscripts, and multiple-rejections, by-various-journals, dampen the-spirits of untrained-academic-writers, resulting in their-reduced-productivity. Scientific-style-writing may be ‘thorny’, in-the-beginning, for ‘greenhorn’-writers, but clear-communication and concise-writing, can-be-trained. The-main-objective of this-paper is to-offer early-stage-researchers (beginner researchers and scientific writing-apprentices) easy-applicable, yet, theoretically-insightful-introduction, to-the structural-components of-a-scientific-paper and basic-writing-guidelines. The-seasoned-writers will also find few-interesting revelations and ‘food-for-taught’. This-paper focuses on-scientific-writing (mainly for peer-reviewed publication) and largely presumes no explicit-disciplinary perspective, however, some-emphasis on-engineering-research, is given. The-main-instruments applied in this-study were: a-survey and a document-analysis. The-respondents identified, that almost-every-section of a-scientific-paper, is challenging, for them, although to a-different-extent. Majority (64%) indicated that they have-experienced rejections, in-their-publishing-endeavors, while the-rest said, that all-their-submissions, for-review, were successful. Out of those, experienced rejection, 57% stated, that, they usually re-submit, their-manuscript, to a-different-journal, after improving or correcting it, while 43 % preferred to-do nothing, after the rejection. 55% also confessed that they: (1) are not very-confident, in their-ability, to-write (for scientific- publication) in-English, and (2) do-not-know exactly what constitutes a-good-research-paper and fine scientific-writing. 36% stated that they are not so-sure about the-proper-structure of a-scientific-paper. The-study also-revealed some-signs of Dunning-Kruger Effect, in-writing, particularly, among-younger faculty. To-address the-findings of the-research, and to-give a-multifaceted-perspective, on-the-scientific-writing, the-paper, in-addition, presents a-fusion of guiding-principles, found in-literature, and supplemented by the-author’ input, about structuring and writing a-scientific-paper. In-particular, the-following was elaborated on: Misconceptions about scientific-writing; Expanded ‘Hourglass-Model’, based on the-IMRaD-format; Micro-issues of writing (grammar and punctuations); How to-deal with-rejection of a-manuscript; English as de facto language of scientific-communication; Characteristics of good-scientific-paper and writing-style; and Establishing one’s unique-voice, in-scientific-writing, among-others. The-study is important; in making a-contribution (in-its-small-way) to-the-body of knowledge, on-the-subject-matter, and it-is-potentially-beneficial, to-scientific-writers, at any-stage, of their-research and scientific-writing- career.

Keywords: scholarly article, paper structure; journal publications, English, rejection, hyphen.

1. Introduction


Writing is one of the-remarkable-symbols and milestones of the-evolution, of human-civilization; it is a-medium of human-communication, which expresses language and emotions, through the-inscription or recording of signs and symbols. The-history of writing goes-back to-about the-4th-millennium BCE, when the-complexity of trade and administration, in-Mesopotamia, outgrew the-capacity of human-memory, and, hence, writing became a-more-dependable-method of recording transactions, as-well-as, historical and environmental-events, in a-permanent-form (Powell, 2009).

The-advent of writing marked a-distinguishing-line between pre-history and permanently recorded history. Pre-history mainly-involves drawings; as-well-as: songs, rituals, legends, and myths—composed orally, and preserved (by-memory), for the-purpose of passing them, from one-generation to-the-next, by a-spoken-word. The-writing’-permanence has-made-possible such-intellectual-developments, of human civilisation, as: literature (including scientific-writing); publishing (including scientific-writing and its-publishing); libraries; and dictionaries, to-mention just a-few. Scientific-writing, broadly-entails: caring out a-comprehensive-literature-survey, gathering and analyzing data, and writing and polishing numerous- versions, of a-manuscript.

For the-benefit to potential-readers, there is a-need, to-clarify some-differences among academic/scientific and science writing (also-called ‘popular-science-writing’). Many of us, use these terminologies interchangeably; however, there are some-distinctions, which are helpful to-appreciate, for those of us, wanted to-be precise. In-essence, academic and scientific-papers are published, in-peer reviewed research-journals, for the-community of scientists, while popular-science-writing is for-readers, who-are not. Davies (2008), for-example, points-out that,
many-scientists, in-communicating with the-wider-public, operate from the deficit-model, which assumes ‘public-deficiency, but scientific sufficiency’. Scientific-writing is technical-writing, by a-scientist, published in peer-reviewed-research journals, for the-an-audience of extremely-specialized-community, of other-scientists. For-example, journals like Nature, Science, and journals published, by a-large-reputable-publishers, with many-journals, e.g. IISTE, and so-on, publish scientific-writing. Science-writing is writing about-science, for the-popular-media. The-audience is much-more-general -- anyone with an-interest in-science, who-are not specialists, in-the-discipline. Science-writing is published in Scientific American, Discover Magazine, or, National Geographic, among-many-others.

In-general, scientific-writing tends to-be more-clearly-focused, less-paratactic, less-personalised, with information quite-densely-packed. In-addition, for this-type of writing, the-suppression of slang, colloquial and humorous-elements is in-order. A-number of grammatical-devices have-been also-introduced, which make the-text heavier and more-objective, as-well. One of such-devices is objectification, turning concrete-processes into abstract-things; done by back-grounding and/or fore-grounding of the-information, in-ways that allow an-argument to-be effectively-developed. Moreover, scientific-writing should-ascertain precise, objective, clear, and logical-claims, with semantic-connections among-events, entities, and attributes, etc. (Derntl, 2003).

On-the-other-hand, Rosales et al. (2012), identified three-different-approaches, to-writing: (1) a-skills-approach; (2) a-process-approach, also called academic-socialization; and (3) an-academic illiteracies-approach. According to the-skills-approach, writing is seen as a-generic, cognitive, individual- skill. If a-person cannot write, in an-academic-context, it-is because they have not acquired the-necessary skills. The-process or academic-socialization-approach implies that writing is not a-skill that can-be acquired, generically, but is tied to-particular-disciplines or contexts. This-approach acknowledges that-different disciplines have particular-writing-genres and ways of using-language. Academic-illiteracies approach, on-the-other-hand, is considerably-different, from the-preceding-two. It presumes that writing, in an-academic-context, is complex and unstable; it is about learning and gaining an-identity, in ever-changing disciplinary-requirements, and also developing-authority, in-a-particular-context. The-context is constantly shifting, being situated, in-time and place. Moreover, the-term ‘illiteracies’ acknowledges that academic writing encompasses more, than just-writing. A-writer needs critical-literacy, visual-literacy, research-literacy, information-literacy, and so-on, to-be a-really-successful-writer—writing-with-authority. From this- perspective, writing is something that acquired, over-time and with practice, by participating in-research activities and research-dissemination-process.

In-addition, according to Anderson (2003) academic-writing should-be: (1) Discipline-specific (writing that conforms to-methods and conventions, expected within an-academic-field of study; demonstrates one’ knowledge of the-demands of one’ academic-community; and shows, that one is a-member of a-particular-academic-community); (2) Evidence-based (statements should-be-supported by-verifiable-facts, figures and other-knowledge; and by-relevant, real-world-examples (if possible)); (3) Balanced (writing should show a-range of background-reading on an-issue; statements should-be-based on-logical-reasoning; discussions should-present, opposing-views, fairly; conclusions should-be-drawn, from careful-reflection, of the-evidence); and (4) Truthful (statements should-be-based on-accurate, current-data and state-of-knowledge/art; information should-be from reliable-sources; proper-citations should-be-given, for the-sources of information and ideas; and writing must-conform to-standards of academic-honesty and integrity).

According to Day (1983), a validly-published-scientific-paper must-contain the ‘first-disclosure of results with sufficient-information, to-enable peers to: (1) assess observations, (2) repeat experiments, and (3) evaluate intellectual-processes’.

The-reasons, behind scientific-writing, range from the-dignified-selflessness, to-base-reasons of self-indulgence. Selflessness, for-example, altruism, is where one passionately-writes, purely for-the pleasure of writing, in-itself. This-pleasure derived, from the-creative-activity of writing, and from sharing one’s intellectual-quests, for the-desire to-advance human-knowledge, for the-benefit of humanity, at-large. For such-few-authors, writing is an-instrument of expression the-joy of scientific-discovery. At the-other extreme is a-self-indulgence, where writing may-be-considered, by-some, to-be an-imposed obligation or, even, a-burden, or a ‘necessary-evil’, needed, to-fulfill specific-minimum-requirements (for-example, number of publications), e.g. for gaining a-promotion.

Moreover, Booth et al. (1995) convey three-motivational-reasons for writing-up and publishing research-findings, such-as: (1) to remember, because once something is forgotten, it-cannot-be reproduced, correctly, without having written-notes; (2) to understand, as writing about a-subject can only be accomplished, by-approaching the-subject, in a-structured-way, which itself leads to-better-understanding thereof; and (3) to gain perspective, as writing includes looking at something, from different-points of view, and obtaining a better-understanding of the-own-ideas and results. Peat et al. (2002), on the-other-hand, has-listed several-more-pragmatic-reasons, for writing-up and publishing-research results, such-as: (1) having results, that are worth-reporting; (2) wanting to-progress Science; (3) desiring to-reach a-broad-audience; (4) improving the-chance of promotion; and finally (5) it-is, simply, unethical, to-conduct a-study, and not report the-findings. For many-
academicians, it-is, actually, an-implicit or unequivocal-requirement to-publish-papers. In-addition, Stock (2000), pointed-out on the-following- stimulus for researchers, to-write and publish their-research-work, as-follows: (1) scientific-communication (O’Connor (1995), for-example, points-out that this-is essential, if science is to-progress); (2) ideal and legal-protection of intellectual-property; (3) gaining reputation; and (4) thinking in-economic-measures, ‘sale to-achieve high-prices’ may-be-transformed to ‘publish to-achieve many-citations’ (economic-theory of science).

The-following-scenarios, however, are not-uncommon, where, for-instance: a-researcher made a-scientific- innovation, or a-discovery, but: (1) never wrote-it-up and published it; (2) it took too-long to-write it-up, so someone-else publishes-it-first; and (3) they produced a-manuscript, but could-not-publish, due to-financial-constrains; and (4) they publish-the-findings, but nobody-understands, what, exactly, is written (due to-poor, vague, or misleading-scientific-writing); and so-on.

On-the-other-hand, scientific-writing and publishing, has numerous-benefits, such-as: Personal developments (through scientific-writing and publication, the-author achieves expertise and, eventually, becomes-acknowledged, by-academic-peers, as an-authority, in-similar-fields of endeavor); Career-benefits (initial-appointment to an-academic-position; renewal or confirmation of that-appointment; and promotion to a-higher-level-appointment); Professional-benefits (invitations to-lecture, or give a-key-note-speech, at-different-scientific-forums; appointments as-consultants to-external-agencies, expert-panels and advisory boards, and to-reviewer and editorial-boards; accreditation by professional-bodies, and application for-membership in-prestigious-learned-societies. From the-academic-research-point of view, writing and getting-published, improves one’s prospects, of being-successful, in-applications for research-funding, extension of funding, and to-obtain further-funding. Grant-awarding-bodies, usually, closely-examine the publication-track-record, of the-applying-researchers, when considering dispensation of funds. Institutional benefits (publication in peer-reviewed-journals is arguably the-most-important-means to-get international- recognition, not-only for an-individual, department, School or Institute, but for the-affiliated-University, as-well, contributing to an-institution’s academic-prestige and standing (Peh, 2008). It can-also serve, as a-channel, to-establish-links, with other-research-centers, for-potential-training, and research-opportunities.

An-end-product of scientific-writing is a-published-scientific-article, which is a-technical- document, describing a-significant experimental, theoretical or observational-extension, of current knowledge, or advances, in the-practical-application, of known-principles (O’Conner & Woodford, 1976).

1.2. Scientific-publication: its essence and types


A-scientific-publication is a-document, in-printed (‘hard’) or electronic (‘soft’) form, which reports the results of original-research. It-is-important, to-emphasize, that a-research-article should-report on research-findings, that are not-only-sound (valid) and previously-unpublished (original), but also add some-new-understanding, observations, proofs, i.e. potentially-important and value-adding-information (Gordon, 1983). A-published-scientific-article, on-the-other-hand, is an-unquestionable-indicator of an-achievement, of a-certain-academic-standard. It represents the-only-permanent-record of the-scientific work, which has-been carried-out, completed, and accepted, by-peers. Besides, a-publication presents a-basis, for further-opinions, views and critiques, from fellow-experts-professionals and academics, separated, by-distance, and by-time. Publication of research-findings, in a-reputable peer-reviewed-journals (with high-impact-factor) can-be also-considered as a-dominant-international-currency, for employability and acceptability, which goes-beyond any-institutional and political-boundaries. Besides, according to McCulloch (2016); ‘To-have a-certain-number of publications, of specified-quality, is not-only to-be ‘ref-able’, but also to-be employable and promotable’.

Major-types of scientific-publication are, as-follows: (1) Book; (2) Book-Chapter, in an-edited-volume; (3) Book-review; (4) Research-Paper; (5) Review-Paper; (6) Conference-Paper/Abstract/ Poster; (7) Thesis/Dissertation; (8) Short-Communication; (9) Monograph; (10) Translation-text; (11) Essay; (12) Explication; (13) Grant-applications; (14) Course-syllabi; and (15) Manual/instructions/guidelines.

In-addition, Eunson (2009) pointed-out on another-common-type of scientific-writing, such-as Report. A-research-study adds to-the-body of knowledge; this-requirement distinguishes a-research-paper, from a-report. Reports categorized as: Technical-brief; Feasibility-report; Experimental/research-report; Progress-report; Procedure/task-report; Field-report; Quality-control-report; Investigation-report; Test/ laboratory-report; Hazard-report; Evaluation-report; and Proposal-report, among-others.

This-study focuses on scientific-writing for scholarly (peer-reviewed)-paper.
1.3. Lack of awareness and misconceptions, about scientific-writing; and Rejections of manuscripts, for publication.

According to Irvin (2010), there are several surprising misconceptions (myths) about scientific-writing: (1) The ‘Paint by Numbers’ myth: Some-authors believe, they must execute consecutive-steps, to write ‘correctly’. However, rather than being a lock-step linear-process, writing is ‘recursive’ (e.g. during-writing, authors do cycle-through, and repeat the various activities, of the writing-process, many-times); (2) Writers only start writing when they have everything figured out: Writers figure-out much of what they want to-write, as they write it. An analysis of the already-written-parts, breaks a subject apart, to study it, closely, and from this inspection, ideas for further-writing emerge; (3) Perfect first drafts: Sometimes, writers put unrealistic expectations on early-drafts. However, no-one writes perfect-first-drafts; polished-writing takes a lot of revision; (4) Some got it; I don’t—the genius myth: When one sees their writing ability, as something fixed, or out of one’s control (as if it were in one’s genetic-code, which cannot be changed), then one would not believe they can improve, as a-writer, and as a result, they do not make any efforts, in that direction. With effort and study, however, one can improve, as a-writer; (5) Good grammar is good writing: When people say ‘I cannot write’, they, often, mean that they experience problems with grammatical-correctness. Writing, however, is about more than just grammatical-correctness. Good writing is a matter of achieving one’s desired effect, upon an intended audience; and (6) Never use ‘I’: Adopting this formal-stand, of objectivity, implies a distrust (almost-fear) of familiarity and, often, leads to an artificial, puffed-up prose. Nevertheless, in some scientific-writing situations one has to avoid using not only ‘I’, but also ‘we’ (to recoil, from ironic-inclusion, of potential reader(s)).

Additional delusion is that, scientific or academic writing, is rather complex, as there are so many issues, which must be taken into consideration, to produce a quality manuscript. Indeed, the issues are many, as shown in Figure 1, nevertheless, with continuous practice and focused effort, good results can be achieved, and, eventually, scientific writing could, even, become one’s second nature -- no struggle, whatsoever, just pure-pleasure.

![Figure 1: Issues in academic writing (Fitzmaurice & O'Farrell, 2009).](image)

There are also a number of misconceptions, about rejections of manuscripts, by journals. One of such misconception is: It is not novel to repeat an experiment. Many manuscripts are rejected, because a reviewer said: ‘That is already been done’. Many others have never been submitted because the-writer feared such a response. However, in areas such as Physics, Chemistry, Biology, and Medicine, it is customary that different groups repeat an important experiment, under slightly different conditions, or with slightly different methods to see, if it can be, independently corroborated. Moreover, results are not accepted, by the scientific community, unless they have been independently verified (Denning, 1980).

First-attempt authors often complain on the high rejection rate of their manuscripts. Worsham (2008) substantiates, that the acceptance rate, of any good scholarly journal, is typically quite low, so the chance of rejection is always relatively high. Kapp et al. (2011), mention that the rejection rate of leading international research journals, currently averages around 90%. A study, among editors of 73 accredited South African journals, also confirmed an exceptionally high rejection rate. In addition, according to Masic (2014) cited by Starovoytova & Namango (2016a): ‘Retractions in academic publishing have reached an enormous apex, increasing tenfold, in the last three decades, the biggest reasons for this is plagiarism and duplications (self-
plagiarism) and poor-quality of a-manuscript’. Lack of uniqueness and innovation in research, poor-research-design, inappropriate-methodology, errors in selecting proper-statistical-tools and techniques, inadequate-training on scientific-writing, grammatical and syntax-errors, and various-other-flaws, are major-contributory-factors, leading to a-poor manuscript. In-addition, some-authors arrive to-flawed or statistically-unsupported-conclusions, based on uncritical-acceptance of statistical-results. ‘Critical’ here is not used in-the-sense of ‘to-criticize’ as in find-fault-with. Instead, ‘critical’ is used, in the-same-way as ‘critical-thinking’ is used. A-synonym might-be ‘analytical’. On-the-other-hand, top-journals, repeatedly-rejected, articles, which later-on turned-out to-be scientific-breakthroughs and, even, won the-Nobel-Prize (Fröhlich, 2007); meaning that even great-ideas, which are not expressed-clearly, could-be overlooked and, therefore, rejected.

Furthermore, getting published, in-reputable-journals, is an-extremely competitive-venture. Most-journals receive more-papers than they can-physically-publish; the-more-prestigious a-journal-is, the-higher the-number of submissions-received and rejected-by-it. Logically, poorly-written-papers are the-first-ones, to-be-rejected. Each, of the-above-misconceptions, individually, or cumulatively, might lead-to-problems, in-scientific-writing.

1.4. Research purpose
Currently, at any-university, or a-research-institution, performance-pressure and obligation to-publish, well-publicized-phrase ‘publish or perish’ has become a-necessary-evil (Bajwa & Sawhney, 2016), mainly, for promotions. It has also-created a ‘rat-race’ and rivalry, among-colleagues, for-acceptance, for publishing and for rapid-publication. Besides, a-common-problem, for many-potential-writers is that they-find it-difficult to-formally-translate, the-findings and outputs, of their-research, into an-understandable and publishable-format (Abbarran & Scholes 2005).

On the-other-hand, a-written-word (used, in publishing) is permanent and unchangeable-record. This also-correlates with the-recent-study by Starovoytova & Namango (2017a) cited Baždarić (2009), pointing-out that: ‘The-published scientific-paper is a-strong-reference and lasting-legacy and, forever, shall-remain subject to-examination and criticism’, therefore it should be properly-structured and well-written.

According to Gasparyan (2011), there is, internationally, an-increasing-concern, with the-quality of scientific-writing. In-almost-every academic-discipline, publications are the-most-important and, often, the-only-measurable-output. Even if a-paper get-published, however, its-quality, and value-addition, to-the-particular-field, remain a-big-concern. For-example, it is estimated that not less-than-15% of the-scientific-papers published-worldwide every-year, are not beneficial to the-specific-domain, they-are-covering (Sułcebe & Këllici, 2015). Pöschl (2004), for-example, very-boldly and candidly, expressed his-assessment on the-quality, of scientific-papers:

Large-proportions of scientific-publications are careless, useless or false, and inhibit scholarly-communication and scientific-progress. This-statement may sound provocative, but unfortunately is not an-exaggeration. Many-scientific-papers fail-to-provide sufficiently-accurate and detailed information, to ensure that fellow-researchers can efficiently-repeat the experiments or calculations and directly follow the-line of arguments, leading to the-presented-conclusions. Even in reputable-peer-reviewed-journals with high-impact-factors many-contributions exhibit a-lack of scientific-rigor and thorough discussion. All too often papers fail-to-reflect the-actual-state of-the-art and do-not-take into-account related-studies in a critical and constructive-way.

On the-other-hand, a-major-prerequisite for a-manuscript, to-pass a-rigorous-peer-review-process, prior to-publication, is a-clean, concise and coherent-writing-style, as-well-as meticulous-organization and elaboration of the-statement, unfolding in-the-paper. To-achieve this, very-many-revisions may-be necessary; first-draft, as mentioned-earlier, in this-paper, is never-perfect. Besides, it is generally recognized, that writing-well is important, for success in a-particular-field of study, as-well-as in a-writing-career (Malkinson, 2008). Moreover, to-be successful in research, it is not enough, just to-publish papers; to-be-victorious, one must-have those-papers cited, by-other-experts (Schimmel, 2012; Malvar, 2008).

Writing is a-universal-form of formal-scientific-communication, and yet, scientists have a-rather dreadful-reputation, for being un-interesting, monotonous and, even, pathetically ‘dry’ writers. Writers, at times, do not have confidence or lose their-confidence in-writing, due to-concerns about their-basic language-skills, or about being-able-to-write the-highly-stylized-language, of a-particular-discipline-papers (Catterall, 2011; Montgomery, 2003). One-reason, behind-that, could-be, that majority of scientists are not-really trained-writers.

According to Badenhorst (2008), ‘Any time you start a new writing project, you embark on a new-journey’. This-passage points to the-courageous and exciting-voyage of discovery, and also reflects the-difficulty that many of us, have with the-process of writing, such-as, for-example, the-struggles to-achieve clarity of thought and briefness of message. On-the-other-hand, many-scientific-writers, once they have-reached a-certain-level of expertise, with academic-writing, do neglect-to-continue developing their-writing-skills, or to-explore their-
identity, as a writer (Rosales et al., 2012).

On the other hand, many international authors have published their research findings on scientific writing; in particular: Norris (2016); Lester & Lester (2015); Sulçebe & Këlliçi (2015); Bonnard et al. (2012); Taavitsainen & Pahta (2012); Jamali & Nikzad (2011); Bazdarić (2009); Anderson (2003); Hengl & Gould (2002); Hammermeister (2002); Procter (2002); Koopman (1997); and Swales (1993), among others. Those authors looked at different elements of scientific writing; at times, they focused only on one single element, e.g. a title, an abstract, or a lexicon, therefore giving fragmented coverage. Other writers, according to Rosales et al. (2012), focused on tools or skills, rather than on the process of writing. This work, however, attempts to present the subject matter in a more systematic way; covering the entire process and considering scientific writing as an integral part of research, an intermediate process, between Research process and a Scholarly publication (see Figure 2).

Figure 2: Focus of the study (modified from Starovoytova, 2017b).

Pressure to publish, poorly prepared manuscripts and multiple rejections, by various journals, dampen the spirits of writers; particularly so for ‘greenhorn’ writers, at the beginning of their writing efforts. Nevertheless, clear communication and concise writing, for a scientific audience, can be trained (Davis, 1997). In this regard, the current paper presents a fusion of a survey, on the scientific writing, at Engineering school, and guiding principles, found in literature, supplemented by the author’s input, about structuring and writing a scientific paper. The main objective of this work is to supply early stage researchers (beginner researchers and scientific writing apprentices) with practical introductory guide to the structural components of a scientific paper and basic writing guidelines. The seasoned writers, on the other hand, will also find few interesting revelations and ‘food for taught’. This paper focuses on scientific writing (mainly for peer reviewed paper) and presumes no explicit disciplinary perspective.

To give a multifaceted outlook on the scientific writing, the paper also presents a fusion of guiding principles, found in literature, and supplemented by the authors’ submission, about structuring and writing a scientific paper. In particular: Misconceptions about scientific writing; Expanded ‘Hourglass Model’, based on the IMRAD format; Micro issues of writing (grammar and punctuations); How to deal with rejection of a manuscript; English as de facto the language of scientific communication; and Establishing one’s unique voice, in scientific writing, among others, were elaborated on.

The study is important and potentially beneficial to scientific writers, at any stage, of their writing career.

2. Materials and Methods
2.1. Design of the study
The study was divided into 3 distinctive parts, which shown in Figure 3.

Figure 3: Sequential parts of the study (Starovoytova & Namango, 2016b).
In-addition, interested-readers could refer to Starovoytova et al. (2015), to-find informative synopsis regarding Kenya and its-educational-system. Besides, study by Starovoytova & Cherotich (2016) provides valuable-particulars, on the-university and the-school of Engineering, where the-study was conducted.

2.2. Sample size
To-evaluate perceptions on-scientific-writing, among-senior-faculty, at the-Engineering-school, a-designed confidential self-report-questioner was used, as the-main-instrument for this-study, with the-sample-size of 15 subjects.

2.3. Main instrument - the questioner
Analogues to Starovoytova (2017b), the-study implemented an-approach of projective-technique, by requesting questionnaire-respondents questions, about their-perceptions on scientific-writing of research findings. The-respondents were-guaranteed-confidentiality, and the-questionnaire was filled in anonymously, with no-identification-information. A-designed-self-report-questionnaire was used in eliciting-information, from the-subject-sample; it consisted of two-sections, first-section is the-demographic characteristics of the-subjects; second-section, is on the-personal-views of the-faculty on scientific-writing, itself and relevant, to it, issues.

2.4. Data Analysis
The-questioner was pre-tested, to ascertain its-validity and reliability. Validity was tested by pre-testing of the questioner, analogues to Starovoytova et al., (2016). Moreover, the data-collection-instrument was subjected to statistical-analysis to determine its-reliability, via a-Cronbach’s alpha-co-efficient (Kothari, 2004), computed by the-Statistical-Package for Social-Sciences (SPPS-17) version 22-computer software program. Descriptive-statistics was also-used to-analyze both; qualitative and quantitative-data.

3. Results and analysis.
3.1. Validation of the instrument
Upon-validation, the-questioner was found acceptable (in-terms of its coverage, length, and organization) with minor-editing. Questionnaire-data were-coded, entered into-SPSS, and checked for-errors. Data were analyzed, list-wise, in SPSS, so that the-missing-values were-ignored. Cronbach's-alpha-test of internal-consistency was-performed, and established high-inter-item-consistency (Cronbach's $a > 0.8$).

3.2. Analysis of the questioner.
Total of 15-questioners were administered, out if which, 11 were submitted-back, giving a-response-rate of 73 %.
3.2.1. Analysis of part1: Demographic-Characteristics
Figure 4 shows Demographics of the-participants of the-survey.

Figure 4: Demographics of the participants (Starovoytova, 2017b).
3.2.2. Analysis of the-responses
The-respondents identified the-section(s) of a-paper, which is/are the-most-challenging, for them, to-write, as-follows: Analysis of results 45%; Abstract 36%; 27% indicated Materials & Methods and Results sections; Discussion, Recommendations and References were equally-difficult for 18% of the-respondents, while Introduction perceived as difficult by only 9%.

Moreover, 36% stated that they are not so-sure about the-proper-structure of a scientific-paper.

Majority (64%) indicated that they have-experienced rejection, in-their-publishing-endeavours, while the-rest said, that all-their-submissions, for-review, were-successful.

Out of those, experienced rejection, 57% stated, that, they usually re-submit, their-manuscript, to-a-different-journal, after improving/correcting, while 43 % preferred to-do nothing, after the rejection.

55% confessed that they are not very-confident in their-ability to-write (for scientific-papers), in-English.

4. Discussion.
This-section will try to-address the-major-issues, revealed by the-responses, as-well-as, matters arising from these-issues.

4.1. Rejection experiences
Majority of respondents (64%) indicated, that they have-experienced rejection, in-their publishing-endeavors. The-enthusiasm and the-joy of writing, diminish with-repeated-rejection of manuscripts, even, in-authors, with good-potential (Kurdi, 2015; Onwere, 2014; Sharma, 2010). Within the-academy, publications are considered the-dominant-currency, of employ-ability and promote-ability; hence, rejections tear-down author(s) self-esteem.

Rejection of a-manuscript, by a-journal, although, devastating at-first, is not really the-end of-the-world; on-a-contrary, the-authors should-appreciate-the-efforts-made by the-reviewer(s) or editor(s)'and for giving the-author(s) an-additional-chance toward producing a-high-quality-output, in-terms of both; communication-quality and scientific-merit. Good-criticism is constructive and proper-review-report, usually, points-out on the-limitations of a-paper, giving author(s) a-road-map of the-appropriate-course of action, to-transform a-paper to a-higher-level of an-acceptable-standard, which will greatly-enhance the-probability for-acceptance, at-the-second-try. Authors should respond to each-issue, raised by-the peer-reviewer(s), in-a-systematic way—either; defend their-position in an-objective, justifiable-way, or comply with the-suggestion, by modifying the-text, then, following-the-editor's instructions, and re-submitting the-improved-manuscript, in-a-timely-fashion.

For-example (Turbek et al., 2016) stated, that: (1) if the rejection is due-to-paper’ being-outside-the-scope of the-journal, to which it was first-submitted, it-is-logical to-submit it, to a-more-relevant-journal; (2) if the-reason, for dismissal, is scarcity-of-data, or insufficient-analysis, or other-technical-reasons, the-deficiencies could-be-rectified by-gathering-more-data, undertaking-more detailed and appropriate-analyses, providing-additional-interpretation of results, and so-on; and (3) if the-authors are convinced that the-reviewers’ lack of proper-understanding of the-authors’ viewpoints, is the-dominant-reason, for-rejecting the-paper, the-authors could-offer more-detailed and compelling-explanations. In-such-situations, the-author(s) should-seek the-editor’s suggestions, and advice, on-the-best-way, to-proceed.

In this-study, out of those, experienced rejection, 57% stated, that, they usually re-submit, their-manuscript, to a-different-journal, after improving or correcting it, while 43 % preferred to-do nothing, after the-rejection. The-negative-reviews, may-result in: (1) re-submission, after correction, for re-review, or (2) outright-rejection. In the-first-case, the-article is, still, existing; but there-is, an-uphill-task, to-bring it-up, to-the-required-standard; whereas, in-the-second-case, the-article is dead, with that-journal. But the-author(s) can, still-try to-resuscitate it and submit, the-improved-version, to-the-other-journal. The-rejected-writers, in this-study, preferred this-option.

On-the-other-hand, authors, are strongly-advised not to-pursue swap-publication of a-paper, rejected for-fatal-flaws, because that could-damage their-career and reputation. Moreover, 43% of the-respondents, preferred to-do nothing, after the-rejection; for some of these, it-could-be the-end of-the-road. Overall, this-withdrawal is very-regrettable, and it-is, indeed, a-potential-loss, as these-writers not being-able, to-reach their-writing-potential and fully-contribute, to-the-developments, in-their-field. In such-cases, senior-colleagues should-come into-the-picture, sharing their-experiences of their-own negative reviews, and providing their-support, encouragement (never to-give-up) and guidance, on-how to-improve the-rejected-manuscript.

The-study also showed some-signs of Dunning-Kruger Effect, in-scientific-writing, particularly, among younger-faculty. This-effect refers to-the-tendency of people, who are-unaware of how-little they-know about a-subject, to-be-overly-confident, of their-abilities and judgment. The-effect consider, that unskilled-people often rate their-knowledge and ability much-higher, than it, actually, is, suffering from illusory-superiority, while more-highly-skilled-people underrate-their-own-abilities, suffering from illusory-inferiority. An-implication of the-Dunning-Kruger-effect is that people, who know, a-little about a-subject, may-assume they understand it, more, than people, who have-more-knowledge, and are-able to appreciate how-little they-really-understand. This-effect, hence, could be contributing to-numerous rejections, as inexperienced-writers overestimate, their
knowledge and abilities, for example, on scientific writing-process. This overestimation, in-turn, results in situations, where young-writers, at-times, submitting their manuscript for review, with no proof-reading done, by the more-experienced-colleagues. The writers should engage a ‘critical-friend’, to review and improve the quality of the manuscript. This aspect of ‘informal-review’ can also be achieved, through the use of a ‘publication syndicate’ (Gee, 2011; Rhoads, 2006; McVeigh et al., 2002; Baldwin & Chandler, 2002)– a small group of colleagues, who review each other’s work-in-progress, on a regular basis, in a proven, safe, and collegial manner.

Respondents also complained, that editors rejected results, which are considered as negative, and, hence, discouraged them, from publishing. In the author’s humble opinion, negative results should be published, due to following considerations: (1) negative results are also results; and (2) if negative results are not published, other researchers would be completely unaware of them and would, then, repeat the same research, with the same negative result, going round and round, and, hence, wasting their time, energy, and resources.

4.2. General structure of a scientific-paper.

36% stated that they are not so sure about the proper structure of a scientific-paper; hence, it will be discussed further.

The three basic aspects, to effective scientific writing, are: thought, structure, and style. Thought is a matter of having some worthwhile results and ideas, to publish. Structure is simply a matter of getting the right things, in the right place. Style is a matter of choosing the fewest and most appropriate words, phrases and terminology, and using the rules of good grammar.

Prior to exploring the micro-issues of writing (lexicon, grammar, and punctuation), it is beneficial, to review the macro-issues, particularly, the structure of a scientific-paper. Writing a journal article, can be an overwhelming process; however, breaking it down, into manageable tasks, can make the overwhelming, the routine. Each part of a paper serves a different purpose, and has a narrowly defined content and purpose. Understanding how each section functions, will help the authors minimize overlaps and repetitions, hence, contribute to clarity and brevity, in the writing presentation, of the study’s findings (Cáceres et al., 2011).

Unlike a novel or a newspaper article, a scientific article has a required structure (well-defined procedure) and style, which is by international consensus, known as IMRaD– ‘Introduction, Methods, Results and Discussion’ (Hengl & Gould, 2002), which is considered as a non-arbitrary format, directly reflecting the process of scientific creation and discovery (ICMJE, 2011).

The structure of a research paper, comprises 3 core parts, namely: introduction, body and discussion. According to Swales (1993) the progression, of the thematic scope of a paper, within these parts, typically follows a pattern called the ‘Hourglass Model’ (see Figure 5a). Virtually every form of academic writing, follows this model, in general (Anderson, 2003).

(a)                                          (b) Figure 5: Structure of a scholarly paper.  (a) Original ‘Hourglass Model’ (Swales, 1993); (b) Expanded ‘Hourglass Model’, based on the IMRaD format.
The-subsequent-sections, of this-publication, are to-explain, sequentially, every-element of the-expanded-model (how scientific-research-papers should-be organized, to-meet the-demands and norms of scientific-publications).

4.2.1. The-Title-section
Great-scientific-writing starts with understanding on how-to-write a-great-title. This-is one of the-most important-tasks and, hence, it-is read, first, and it-is read, the-most. In-many-cases, it-is the-only part that is read of one’s-paper, meaning that the-title, in-fact, failed to-attract, or to-appeal-to a-potential reader, even if it-was-relevant, to a-reader-inquest.

According to Jamali & Nikzad (2011), the-prevailing-trend is, said to-be that, on-average, the-number of readers from one-section of a-paper to-the-next, in-the-above sequence of Figure 5(b), decreases by a-factor-of 10. That means for-every-10-readers, who look at-the-title, one reads the-Abstract; for-every-10, who read the-Abstract, one goes to-the-Results-section, especially Tables and Figures; for-every-10, who read the-Results, only-one-reads the-full-paper. Consequently, for every-person, who reads the-full-paper, 1,000 people read the-title!

The-title has two-functions: (1) to-attract other-researchers, to-read one’s-paper; and (2) to-provide, the-best-information-possible, to-help electronic-search-programs find one’s-paper, easily. Electronic indexing-services rely-heavily on-the-accuracy of the-title, to-allow users to-find papers, that are relevant, to their-research. The-title may-be-reprinted, in-bibliographies and subject-indexes, stored in-bibliographic databases, and cited in-other-articles. Therefore, the-title is an-extremely-important-component of a-paper, and therefore, it should-be, at-a-very-minimum, good, if not excellent.

Day (1983) defines a-good-title as: ‘the-fewest-possible-words that adequately-describe the contents of the-paper’. In-addition, the-title: (1) Should concisely-convey the-fundamental-nature of the-research; for-example, variable-factors manipulated, parameters-measured, etc. may-be-included; and (2) Phrasing the-title as a-question can-be-powerful and effective. Besides, according to Peat et al. (2002), effective-titles should: (1) Identify the-main-issue of the-paper; (2) Begin with the-subject of the-paper; (3) Be-accurate, unambiguous, specific, informative, and complete; (4) Attract readers; (5) Contain as-few-words, as-possible (many-journals limit titles to 12-words); (6) Be unproblematic to-understand and not misleading; (7) Describe the-contents of the-paper (ideally, the-methodological and content-specific substance of the-paper) accurately and specifically; (8) Avoid abbreviations, formulas, and jargon; (9) Not include any-verb; (10) Not contain low-impact introductory-words, such-as: Observations, Investigations, Study, and Effect of, among-others ; (11) Not-be ‘flashy’, as in-newspapers (avoid over-statements and exaggerations); (12) Report the-subject of the-research, rather than the-results; and (13) Follow the-style preference of the-target-journal.

Furthermore, Jamali & Nikzad (2011) differentiate title-types, as-follows: (1) descriptive titles, which describe what the-paper is about (e.g. ‘Investigating the-role of academic-conferences on shaping the-research-agenda’); (2) declarative titles, which make a-statement about the-results, presented in the-paper (e.g. ‘Academic-conferences shape the-short-term research-agenda’); (3) interrogative titles, which pose a-question (e.g. ‘Do academic-conferences shape the-research-agenda?’); and (4) compound titles, which may combine several of the-above, separated by colons, or question-marks (e.g. ‘Do academic-conferences shape the-research-agenda? An-empirical-investigation’).

The-same-authors, further, investigated the-impact of the-title-type, on the-download, and citation-count of a-paper; interrogative-titles have more-downloads, but fewer-citations. Compound-titles (with colon) are longer, and have fewer-downloads and cites. Long-titles tend-to-get fewer-downloads and citations, than shorter-titles (Jamali & Nikzad, 2011). In-synopsis, a-great and effective-title should-be catchy and should-give maximum-information, in-the-smallest-amount of allowed, by the-publisher, space.

4.2.2. The-List of Authors section
Authorship is about publicly putting one’s name, to a-scientific-publication. The-authors-list should-include all-those, and only-those, who-have actively participated in-the-work. In-particular, the-authors must fulfill all of the-following-four-criteria: (1) Substantial-contributions, to-the-conception, or design of the-work; or the-acquisition, analysis, or interpretation of data; (2) Drafting the-work, or revising it, critically, for-important-intellectual-content; (3) Final-approval of the-version, to-be-published; and (4) Agreement to-be-accountable for all-aspects of the-work, ensuring that questions, related to-the-accuracy or integrity, of any-part of the-work, are appropriately-investigated and resolved (Şulçebe & Këlliçi, 2015). Only-those, who-have-met, all-four-criteria, for-authorship, should-be designated, as-authors. Those, who do not-meet all-the-criteria, should-be included, in the-acknowledgement-section, of a-paper.

The-major-problems with authorship-issue are: (1) the-exclusion of deserving-participants; (2) the-inclusion of undeserving-ones; or (3) order-disputes. ‘Honorary’, ‘guest’, or ‘gift’ authorship includes these, who had-little, or nothing to-do-with the-content of a-paper. ‘Gift’ authorship, for-example, occurs when someone, who has not...
made an-intellectual contribution to a-paper, accepts, or even insists on, an-authorship (Rennie & Flanagan, 1994). These-kind of authorship dilute the-credit, due, to-the-people, who-actually did-the-work, inflates the-credentials, of the-illegally added-authors, and makes the-proper-attribute of credit more-difficult, and, hence, should-be-avoided. Similarly, ‘ghost’-authorship, where a-person, who-writes a-paper is not-listed, among-the-authors, misleads readers, and also should-be-condemned. A-recent-study by Starovoytova (2017c) on barriers to-scientific-research, have exposed yet-another-kind of authorship, brutally-honestly, named as ‘publishing prostitution’.

Besides, the-list of authors establishes accountability, as-well-as, credit. Ideally, any-part of an-article, critical to its-main-conclusions, must-be the-responsibility, of at-least one-author. On the-other-hand, apportioning-credit, for work-done, as a-team, can-be difficult, nevertheless, it needs to-be allocated, appropriately. Authorship-conventions may-differ, greatly, among-disciplines, and among research-groups. In-some-disciplines, the-group leader’s name is always-last, while in-others it-is-always first. In-some-scientific-fields, research supervisors’ names rarely-appear on-papers, while in-others the-head of a-research-group is an-author, on almost-every-paper, associated with-the-group. Besides, authors, contributing-equally, are listed-alphabetically, and the-publication specifies equal-contribution. According to Templin (2001), in-Japan, however, authors are-frequently listed, in-order of their-academic rank, rather than by-order, of how-much, each-person, contributed to-the-study. Wager & Kleinert (2010) in-their-study, pointed-out, that a-scoring-system

Moreover, the-distribution of accountability can-be especially-difficult, in-interdisciplinary research. Authors, from one-discipline, may declare, sometimes-rightfully, that they are not-responsible, for the-accuracy of material, provided by-authors, from another-discipline. A-contrasting-view, is that each-author needs-to-be confident, of the-accuracy, of everything, in-the-paper. The-solution to-this-problem is to add a-footnote, accompanying-the-list of authors, which apports responsibility for-different-parts, of the-paper. Journal-Editors, sometimes, may-require authors, to-justify the-assignment of authorship, hence it-is best to-limit authorship, to only the-colleagues, who-made a true-academic-contribution.

Some-journals/publishers require official-contributor-ship; which is defined as authors declaring in detail, in-advance of publication, their-individual-contributions to scholarly-papers (Rennie, 2001).

Selected-fields, particularly-those, for which numbers of authors of 100 or-more, also-known as ‘hyper-authorship’, are not uncommon (i.e., in-certain-sub-fields of physics, such-as astrophysics), where use of randomization-techniques, for the-same fairness-rational-e; even further-complicates the-ability, to-trace-authorship-contribution (Birnholz, 2006; Davenport & Cronin, 2001).

4.2.3. The-Abstract-section
An-abstract, also called the Précis or synopsis, is a-mini-version (summary) of the-whole-paper (Day, 1988), that precedes the-article, and condenses full-paper, into a-fraction, of its-original-space. Basically, an-abstract comprises a-one-paragraph, of a-complete, but selective-summary, of the-whole-paper; hence is usually-written last (after completion of all-the-other-sections), and in-the-past-tense. The-abstract is more-specific, than the-conclusions-section, and can-have a staccato literary-style. Many-times, the-abstract will-be-published, by-itself, in an-index to-the-article, and, often, only the-words in the-abstract can-be-searched, using library-databases; hence, the-abstract is a-critical-element of the-research-paper.

Besides, abstracts have-become increasingly-important, as electronic-publication-databases are the-primary-means, of finding research-reports, in-a-certain-subject-area (Koopman, 1987). An-abstract is the-single most-important-part of the-manuscript, and, yet, often-neglected and poorly-written. On the-other-hand, journals have strict-limitations, on-the-length of abstracts, usually in-the-range of 150-250 words, so, everything-relevant to-potential-readers should-be in-the-abstract, everything-else, should not. Various-methods can-be-used to-evaluate abstract-quality, e.g. rating by readers, checklists (not necessary in structured-abstracts), and readability-measures, such-as Flesch Reading Ease (Bui, 2015; Ufnalska & Hartley, 2009).

According to Day (1983), there are two-general-types of abstract: (1) an informative abstract extracts everything-relevant, from the-paper, such-as: primary-research-objectives, addressed; methods employed, in solving the-problems; results obtained; and conclusions, drawn. Such-abstracts may serve as a-substitute, for the-full-paper; and (2) an indicative or descriptive abstract rather describes the-content of the-paper and may, thus, serve as an-outline, of what is presented in the-paper. This-kind of abstract cannot serve as a-substitute, for the-full-text; while informative-abstracts may-be-viewed as standalone-documents. The-abstract, should-be, preferably, definitive, rather-than descriptive; i.e., it-should-give-facts, rather-than pronounce, that the-paper is ‘about’ something. Alternatively, a-mixed-approach, incorporating both-types; informative and descriptive, can-be used, for-example, like in-this-paper.

Conclusions: What implications does the-answer(s) imply? An abstract must-briefly-present every-component, of-the-study and should: define its-scope; outline the-procedures used (selection of study-subjects, methodology, key-findings, and statistical-methods); summarize its-main conclusions and implications. The-implications and benefits of-the-study should-be consistent, with-the-results and should-be-highlighted. It-should-also include the-research-question hypothesis/aim, very-brief-background (from Introduction), general-summary of-the-methods (from Materials & Methods), significant-results (from Results) and conclusions (from Discussion).

However, there-are-some-things that should not be included in an-abstract, such-as: information and conclusions not-stated-in-the-paper, references to-other-literature, the-exact title-phrase, and illustrative-elements, such-as tables and figures (Day, 1983). Abbreviations or acronyms, unless they-are standard or explained, complex, winding, verbose-sentences, and detailed-experimental-procedures and data, should-be also-avoided. In-addition, institutional-identity should never be-disclosed, in-the-main manuscript, as-majority of-the-journals follow a-double-blinded, peer-reviewed process (Bajwa & Sawhney, 2016), and this-information can-influence the-objectivity of-the review-process, unless, the-research is a-case-study, where identification is unavoidable.

Besides, authors should strive-to-be creative, in generating reader’s-cURIosity; to-enable readers to-make a-judgment, whether to-keep-reading or not, the-abstract is one of-the-most-important-elements, of-a-scientific-article. For further-useful-hints and comments, on preparing and writing-abstracts, refer to Bonnard et al. (2012); Hammermeister (2002); Procter (2002); and Koopman (1997), to-mention just-a-few.

In-synopsis, a-concise and standalone-abstract serves as a-resume for the-manuscript, helping the-readers to-decide whether it-is relevant, to-their-work (Goodman, et al., 2015).

4.2.4. The-Keywords-section
The-key-words (or short-phrases) are expressions, by which-the-paper should-be indexed, by-abstracting services. Words, which appear in-the-title, should not be repeated as-keywords, because titles and keywords are listed-together, by-abstracting-services. They-are, however, should-cover all-aspects of-the-study. Most-journals allow not-more-than six-keywords, while some-journals do-not-allow any-keywords.

4.2.5. Body of a-paper.
Generally, the-body of a-paper answers two-questions: (1) how was the-research-question addressed (materials, methods) and (2) what was found (results) (Day, 1983). The-body of a-paper reports on-the-actual-research-done, to-answer the-research-questions or a-problem, identified in-the-introduction. It-should-be written, as if it-is an-unfolding-discussion, each-idea at-a-time. Normally, the-body comprises several-sub-sections, whereas actual-structure, organization, and content depend-heavily on-the-type of paper, for-example (adapted from Foley (2013):

In empirical papers, the-body of-the-paper describes the-material and data, used-for the-study, the-methodologies applied, to-answer the-research-questions, and the-results, obtained. It-is-very important that the-study be described, in-a-way that makes it possible, for peers, to-repeat or to-reproduce it (Day, 1983).

Case study papers describe the-application of existing-methods, theory or tools. Crucial is the-value of the-reflections, abstracted from-the-experience and their-relevance to-other-researchers, working on related-methods, theory or tools.

Methodology papers describe a novel-method, which-may-be intended for use in-research or practical-settings (or both), but the-paper should-be clear about the-intended-audience.

Theory papers describe principles, concepts or models, on which work in-the-field (empirical, experience, methodology) might-be-based; authors of theoretical-papers are expected to-position their-ideas, within a-broad-context of related-frameworks and theories. Important-criteria are the-originality or soundness of-the-analysis, provided, as-well-as-the-relevance of-the-theoretical-content, to-practice and/or research in-the-field. The-next-sections present constituents of-the-body, of-the-paper, according to Figure 5b.

4.2.5.1. The-Introduction section
The-introduction-section is where a-researcher provides the-background of-the-topic, for-the-reader(s), to-understand the-points, which will-be brought-up, later. Introduction-section should-be-written in present-tense; providing relevant-background-information, with-citations to-other-published-material; should-be developed as a ‘funnel’ (Figure 5 shows that the-top of-the-hourglass is quite-broad; following the-model, this-section, hence, starts with a-very-general-overview of-the-topic (global point-of-view), then slowly focus-in and to-getting more-specific, about the-particular-experiment, leading to-the-purpose of-the-study). The-introduction-section leads a-reader, from a-general-subject-area, to a-particular-field of research. Three-phases of-an-introduction can-be-identified (Swales, 1998): (1) Establish a territory (bring-out the-importance, of-the-subject and/or make general-statements, about the-subject and/or present an-overview on-current research on-the-subject); (2) Establish a niche (oppose an-existing-assumption or reveal a-research-gap or formulate a-research-question, or problem or continue a-tradition); (3) Occupy the niche (sketch the-intent of-the-own-work and/or outline important-characteristics of-the-own-work; and give a brief-outlook, on-the-structure of-the-paper.

Gathering-background-information, and having-past-knowledge, is paramount, in-academic or scientific-writing. According to Sulçebe & Këlliçi (2015), literature-review and a-detailed-coverage of-the-themes, under-
consideration, are-obligatory and must-have the-following-purposes: (1) Identification of knowledge-gaps, in-the-existing, up-to-date, information that the-proposed-article aims to-fill-in; and (2) Avoidance of repeating the-same-message or research-project, of previously-published-material. Besides, the-literature-review (which can-be divided into sub-sections) identifies the-influential historical contributions, outlines the-state of knowledge/art, and justifies the-novelty, of the-article’s contribution. Hence, the-literature-review gives-credit, to our-predecessors, and justifies the-need and novelty, of the-article’s own-contribution.

Another-important-issue is inter-textuality, which is the-combining of past-writings into original, new-pieces of text. Factoring-in inter-textuality, the-goal of academic-writing is not, simply, creating new-ideas, but to-offer a-new-perspective, and a-link, between already-established-ideas. The-specificity and the-originality of the-study, in-question, must-be presented, in-relation to-existing-theories and methods, on-the-subject. Four to five-major-publications on-the-problem/topic, addressed by-the-study, should-be critically-presented. Gaps, encountered in-the-literature, and any-conflicting-data should-be-noted, as-well.

A-good-introduction is relatively-short. It-tells why the-reader should-find the-paper interesting, explains why the-author(s) carried-out the-research, and gives the-background, the-reader-needs to-understand, and to-judge the-paper. It-is paramount, that the-first-sentence, of the-introduction, captures the-reader’s-attention. Particularly, Introduction should: Define the-scope of the-study; Define the-problem; State the-objective(s); Identify-gaps in the-knowledge, about-the-subject; State the-purpose of the experiment; Summarize the-background to-the-research (sufficiently, but not too-widely); State the question(s) that researcher(s) asked; Provide a-context for-the-investigation; Briefly-explain the-theory involved; and Present a-hypothesis (if any), or an-expectations.

Ideally, the-introduction-section should-end with the ‘road-map’ paragraph, which outlines the-remaining-sections, of the-paper. This-paragraph serves two-important-functions: (1) it puts the-complete-contribution of the-article, in-the-context of the previous-contributions; and (2) it guides a-reader, who may-wish to-skip, some-sections of the-article, directly to-the-sections, that interest them. This paragraph will-also-help the-author(s), to-organize and present, the-logical-flow of information.

4.2.5.2. The-Materials and Methods-section
The-section of Materials and Methods (Methodology) is like a-blueprint (map) for the-whole-research, and it-should-be-written, in past-tense, and in-narrative-form. It refers to more-than a-simple-set of methods; it refers to the-rationale, and the-philosophical-assumptions, that-underlie a-particular-study. The-section chronologically-describes the-process (in-the-order it was-performed), to-complete the-research. This section should-provide all-the-information, needed, to-allow another-researcher, to-judge the-study or, actually, repeat the-experimentation.

Authors should-strive to-avoid any unclear, misleading or confusing-statements; particularly-so, when explaining the-procedure-used, and its-purpose. A-good-illustration to-this-end is a-true-story about the-elementary-school science-experiment, to-show the-danger of alcohol: The teacher set-up two-glasses; one, containing-water, and the-other, containing vodka. A-worm was dropped into-each-glass. The-worm in vodka, died-immediately, while the-worm, in-water, swam-around-happily. When the-teacher asked the pupils what the-experiment-showed; little-Kip exclaimed: ‘If you drink vodka, you would not have worms!’ This-illustration confirms, that to-avoid misinterpretation, the-purpose and the-relevance, of the-experiments, should-be clearly-explained, alongside with giving references, to-the-detailed-procedures.

In-particular, the-section should-include: (1) Temporal, spatial, and historical-description, of study-area, and the-selection of the-subjects, under-study/studied-population (if applicable); (2) Functional-variables (such-as: timing, temperature, speed, concentration, etc.) and rational, for tracking those-variables; and (3) Assumptions, underlying the-study. Besides, procedures should-be listed, and described, or the-reader should-be-referred, to-papers, that have-already-described, the-used-procedures. If standard-methods were used, the-reference, to-those, should-be-given, but the-detailed laboratory-procedure should not be listed. Modifications (if any), from the-standard-procedure, however, should-be indicated. Specialized-equipment (if any), should-be fully-described, including brand-name, manufacturer, and year of manufacture, alongside with its-setting-parameters. Besides, statistical-methods, should-incorporate, inclusive-name of software-programs used (Eunson, 2009).

Furthermore, the-authors should-be precise, complete, and concise; include only relevant information, with no unnecessary-information (information that does-not-add any-value, to the-paper).

4.2.5.3. The-Results-section
The-results-section presents the-new-knowledge; therefore, it is the-core of the-paper. It is written, in past-tense, and in narrative-form. The-results, including unexpected or negative-results, should-be only communicated, with no-interpretation. The-presentation of data may-be either chronological (to-directly correspond with the-Methods), or in-the-order of most-to-least importance.

Besides, it may not be-possible, to-discuss all of the-results. Authors-should-focus, on those, which relate-directly, to-research questions/hypotheses, and present the-results, simply and clearly; by reducing-them to, the-statistically-analyzed summary-form of: figures, graphs, and tables. While tables present accurate-numbers,
figures and graphs, show trends and features; the-best-form of presentation should be used; not both. In-addition, figures display important-trends, simplify detailed-data, and show basic-methodologies (Bajwa & Sawhney, 2016), where any-ambiguity, in-the-data, becomes immediately-clear.

The-data, presented in-tables and figures, should not be-repeated in-the-text, but they-should complement each-other. Tables and figures, attract the-most-attention, after Title and Abstract, however, the-authors should use them only if they-are-absolutely-essential and if they-are, indeed, adding value. Each table/figure should ‘stand alone’, to-enable the-reader, to-understand the-contents, without reading the-text. Tables, should-have headings (positioned on-top of tables); figures--captions (positioned at-bottom of figures). Headings and captions should-be explicit, but not wordy.

Moreover, the-SI-system (Le Système International d’Unités) is used, generally, for-reporting measurements, in all-research-publications. Some-exceptions, however, are present for-applied-disciplines; for-example, in Textile-Industry and in Textile-Engineering (originated in Britain), yards, inches, Oz and pounds are still-predominantly-used. Units should be-presented separately, not-as part of headings and captions. To-report the-data, in-tables and text, up to 4digits of data-representation is allowed; decimal points and units should-be-adjusted, accordingly (e.g., 70,000g = 70kg). The-data should-be-given round-off-treatment, e.g. to one-tenth of SE (standard-error) values (if, for-example, SE is 1.756, round-off will read 1.8). In-the-absence of a-particular-number or a-value, in-the-table, ‘/N/A’ should-be indicated, instead of dashes or zero. For numbers less-than 1.0, a-zero (0) should-be added, before the-decimal-point, (e.g., ‘0.734’ instead of ‘.734’). The-preferential-arrangements of data should-be so that similar-elements are read-down, not across, as mental-calculations are-easier, if numbers are-placed vertically, than horizontally.

The-Results-section provides key-findings, in-a-purely-objective-manner, and lay the-foundation, for-the Discussion-section, where those-data are analyzed and interpreted.

4.2.5.4. The-Discussion-section

In-this-particular-section, the-authors explain meanings, and implications of the-results. The-section pulls everything together, and shows the-importance, the-significance, and the-value, of the-accomplished-work and it-is, therefore, the-most-innovative and, for some of us, most-demanding-part, of the-paper, to-write.

Discussion also-provides a-unique-chance, to-authors, to-really-shine, by demonstrating their-ability to-synthesize, analyze, evaluate, interpret, and reason, logically and effectively. The-authors close the-loop, by revisiting their-overall-purpose, research-questions, and hypotheses, and answer the ‘so what’ questions, identifying their-unique-contribution, to-knowledge.

Discussion-section interprets each of the-results, in-detail; it-is written in-both; present and past-tenses. Current-knowledge (from literature) is stated in present-tense, whereas researcher(s) own-work is presented in-past-tense. The-discussion-section should-cover-all-aspects of the-study; it-can-pass also beyond-the-results, achieved, and can-cover or criticize methodological-problems, and express author(s) opinions (van Wagener, 1990), as all-the-arguments are made, in-this-section. Besides, contribution to-the particular-field, is a-great-legacy, of a-scientific-paper; as-such, it-is-necessary that the-authors take their-clear-positions, during-the discussion. Therefore, it is not enough to-just-retrieve the-results and compare them, to-those of other-researchers, rather, it-is-necessary to-contextualize them, in-light of-the-current literature, and recent-advances, in-the-field, explicitly mentioning how the-findings of the-study, answer what was unknown, until now (Cáceres et al., 2011).

The-original-results are to-be-compared with previously-published-works (the-similarities and differences should-be-highlighted, and the-strength and the-limitations (questions left unanswered, major experimental-constraints, lack of correlation, and negative-results) of the-study should-be clearly presented). Findings, at-times, can also-lead to diversion, into-another, and, at-times, unexpected-subject, which makes discussion even more-comprehensive and interesting. A-good-discussion, in-particular, should: (1) Not repeat what has already been-said, in-the review of literature; (2) Relate the-results to-the-questions, that were set-out, in-the Introduction; (3) Show how the-results and interpretations agree, or do-not-agree, with current-knowledge on-the-subject, i.e., previously-published-work; (4) Explain the-theoretical-background, of the-observed-results; (4) Indicate the-significance of the-results; (5) Deal with only the-results, reported in-the-study; (8) Stay-away from generalizations and conjectures, that are-not-substantiated, by the-results presented; (9) State conclusions, with evidence, for-each; and (10) Suggest future-research, that is planned or needed, to follow-up.

Whenever-possible, it-is-recommended to-describe the-effect-sizes, and the-confidence-intervals; since these-information reflect, on the-relevance and applicability of the-findings, and allow the-results to-be-used, confidently, in-future meta-analysis studies (APA, 2008).

Another-common-element in a-discussion-section is the-application of the-results-obtained, to-solve a-specific engineering, or scientific-problem. Some-journals, for-instance, the Journal of Hydraulic Engineering, even require a-separate applications-section, for this-purpose. Authors, however, should-be conservative, e.g., never making a-declaration, of which they are not 100% sure, as not to-open the-door for a-negative-review, or the-eventual-rejection of their-article.
4.2.6. The Conclusions and Recommendations-section

The conclusions is, where the author(s) wrap-it-up, by emphasizing the most-important-findings and their potential-implications. It is-important, to-remember, that this-section should not present any-new information. In-many-ways, the-conclusion-section is a-mirror of the-introduction (notice in Figure 5 how the-hourglass-shape becomes-broad-again at the-bottom; the-paper should do the-same-thing). The-readers should be-brought-away from the-specific-focus of the-research, and back, to a-broad-point of view, showing, for-example, how the-findings apply, to the-world, as a-whole. Conclusion-part should articulate the-key-message, that has been-discussed, in the-manuscript, and also highlight the new and most-original-aspects of the-study. It should be brief, to-the-point, and should not mention anything, which has not been-discussed, earlier in-the-text. Similar to-the-Abstract-part, no-reference should be cited, in this-part of the-manuscript.

It is also-recommended, to-point-out the-limitations of the-study, and to-suggest future-angle. By identifying the-limitations, of the-research, authors demonstrate their-scientific-maturity, and emphasize the-power of generalization, of their-findings. By recommending further-studies, they show commitment to their-field, influencing other-researchers, to-explore new-aspects, of the-same-theme (Cáceres et al., 2011). It is imperative, however, to-realize, that the-authors do not expect to give-recommendations to ‘save-the-world’; besides, identifying weaknesses, or gaps in-the-research, is just as important, as offering solutions-to-problems.

4.2.7. The Acknowledgments-section

Receiving a credit, by the-way-of acknowledgment, rather than authorship, indicates that a-person or an organization did not have, a direct-hand, in-producing the-work, in-question, but may-have-contributed in: funding, criticism, or encouragement to the-author(s). Various-schemes exist, for classifying acknowledgments; Finkelstein (2004), for example, gives the following six-categories: (1) moral-support; (2) financial-support; (3) editorial-support; (4) presentational-support; (5) instrumental/technical-support; and (6) conceptual-support, or peer-interactive-communication (PIC).

Acknowledgement can be expressed in a: (1) general-way, to a-granting-agency, that supplied funds, or a laboratory, which supplied materials and which equipment was-used; and (2) specific-way, to a-person or persons, who gave the-author(s) advice, or helped them in-data-collection or analysis, or any other-significant manner. In particular, any specific-input to the-work, should be acknowledged – e.g. editing, proof-reading, specific-academic-advice or ideas, general-advice or ideas, such as on structuring of the-work, assistance with collecting-data, in the-field or in a laboratory, statistical-support, lab-technical support, support in respect of a specific-disability, translation-services, and so on. Any specific-permissions the-authors were granted; e.g., for use of copyrighted-material, use of a specific-datasets, use of a patented process, etc. There is also a growing trend to acknowledge the contributions of the-reviewers. This is a rather-controversial-issue. Since acknowledgment-sections cannot be referenced, or listed on a curriculum-vitae, this seems only a means of getting the-reviewers to agree with a revision, and accept the paper. And, finally, as Spence (1994) pointed-out: ‘…by all means recognize secretaries, wives, or husbands, lovers and parents – but not in the-manuscript’.

4.2.8. The References-section

Organizing a proper-reference-list is one of the most wearisome-aspects, of finalizing a manuscript, for publication. One of the essential-principles, of scientific-writing, is to avoid plagiarism; hence, credit must be given, when using another person’s ideas, opinions, theories (also quotations or paraphrases thereof), or information, which is not a common-knowledge (see more details in Starovoitova, 2017d). This is achieved by citing, related-work, within-the-text, and by-listing all cited-references, at the Reference-section/list (at the end of the paper).

A citation, or a reference, is a way of properly-acknowledging, where one makes use of the-work of others. ‘Citing’ gives such an acknowledgement, within the main-body of a text, while ‘referencing’ is a broader-term, which covers both: in-text-citations and the more extensive information about one’s source-material, which should be presented, at the end of the-reference-section. These two-terms, alongside with attribution are used interchangeably. One should not include references, which were not cited. Referenced journal-articles, research-monographs, and books, are preferred, over less reliable-sources, such as personal communications, un refereed conference-proceedings, or web-site-addresses.

The number of references should be reasonable (neither too many nor too few). The use of abstracts of conferences and congresses, and unpublished-materials, as references, should be avoided. Personal communications are information, that has been conveyed, personally, to a writer, such as: emails, telephone calls, and direct-conversations, or other material, such as unpublished material or personal letters (not publicly available). These are acceptable-sources and should be clearly indicated, at the point of use, in the-text; for example, (Starovoitova, D. (2016). pers. comm. 7th August), however, they should not be included, in a formal reference list. Moreover, the author supposed to ask permission, from the source, before citing any personal communications. Furthermore, all cited-references, should be verified (as much as possible), by the author(s), using the original sources.

On the other-hand, there is no need to repeat the same-citation, at the end of every sentence, or quote,
provided that no other-sources was used, in that-discussion; the author(s) should make-it-clear, to the reader, that particular-part is all, based on the-same-source. One-way of making the-source clear, without repeating the-full-citation is to-use the-Latin-term ‘ibid’, meaning ‘the-same-place’. For example: ‘Faculty plays a crucial-role in helping students to develop academic-integrity (Starovoytova & Namango, 2016, p.59), and ‘There are many-contexts, in which faculty can explicitly teach students what academic-honesty…’ (ibid).

Besides, different-publishers require different-formats or styles, for citing a-paper, in-the-text and for-listing references. The most-commonly-used referencing-systems are variations of the-following (Day, 1983):

Name and year system: References are-cited by their-respective-authors and the-year of publication, e.g. (Starovoytova, 2017). This-system is very-convenient, for authors, as the-citation does-not have to-be changed, when adding or removing references, from-the-list. However, it becomes difficult to-read, when subsequently-citing many-references, in-one-single-parenthesis.

Alphabet-number system: This-lists the-references in alphabetical-order and cites-them by-their-respective-number in parentheses or (square) brackets, e.g. ‘As reported in [7], …’. This-system is relatively-convenient, for-readers, as it-does-not-break the-flow of words, while-reading a-sentence with-many-citations. On-the-other-hand, the-author has-to-be-watchful on-the-references, cited in-the-text, as their-numbers may-change, when the-reference-list is updated.

Citation order system: This-system is similar to-the-alphabet-number-system, with one-major-difference: the-reference-list is not sorted-alphabetically, but in-the-order of appearance (citation by number) in-the-text.

Name and year system of Referencing is mainly-used for Engineering-publishing, hence, more-details are in-order: (1) with several-publications of the-same-author, in-the-same-year, ‘a’, ‘b’, etc. should-be-used, after-the-year (example: Starovoytova 2016a; 2016b, etc.); (2) when there are 2-authors, citing in-the-text, should-be as, for-example, Starovoytova & Namango (2016), but in-the-Reference section, the-authors-initials should be added, for-each-author, followed by essential-details on the-paper, e.g. Starovoytova, D. and Namango, S. (2016). “…”; (3) when there are 3 or-more authors, the-citing in-the-text should-be, for-example: Starovoytova et al. (2016), and in-the Reference-section all-the-names, with initials of the-authors, should-be given; (4) ‘Mc’ should be alphabetized, following the-order of the-letters, not as if it were written out ‘Mac’, for-example: MacBrayne, MacKenzie, McDonald; (5) in-names, with prefixes such as ‘de’, ‘van’, ‘von’, ‘arab’ and so-on, the-form, in which the-name is-listed by-the-author concerned, should-be used, or the-journal’s-directives should-be set; and (6) so-called ‘hand waving-reference’ should-be avoided, for-example: do-not refer to ‘Madara’s classic work’, without specifying what Madara’s work was or how it is related, to-what is-being-reported.

Variations of the-referencing-systems, mentioned above, are-used, in most of the-common standards, such-as in-the American Psychological Association (APA) Style; Chicago Style; Council of Biology Editors (CBE) Style; and Modern Language Association (MLA) Style (Gibaldi, 1995), among-others. Regardless of the-citation-style, however, there are two-basic-rules for the-list of references: (1) every-cited (in-the-text) source must-be listed (in-the-list of references) and (2) every-listed source must-be cited. In-other-words, the-References-section and text-citations, should match, absolutely, e.g., the-name & year or the-number (in-the-text) connects with-the-full-source-details, in a-footnote and/or in-reference-list.

In order-for a-manuscript, to-be-accepted, for-publishing, authors, have no other-alternative, but adhering to-the-style, imposed on-them by-the-publishers. To-be on a-safe-side, therefore, the-most-important-rule is, to-follow, very-closely, the-instructions, of a-particular-publishing-journal (so-called ‘house style’ for that-journal).

On-the-other-hand, various-computer-software-packages are available, which allow references to-be-readily-recovered, from-databases, easily-inserted, into a-document, and automatically-adjusted, whenever any-alterations are made. These are known as ‘reference management’ packages or ‘reference managers’; examples are: EndNote, Mendeley, Zotero, and RefMe, among-others. Reference-managers store and manage bibliographic-data, and act as a-mini-database of references-used. One can retrieve comprehensive-reference-information, directly from many-online-databases, saving-the-time of typing them-in, by-hand. Besides, references can-be-presented, in whichever-format is required, from a-selection of available-styles.

The macro-issues of writing, such-as the-structure of a-scientific-paper, are universal, regardless, of the-language of expression. The next-logical-step would-be to-describe the-micro-issues of writing (grammar and punctuations); those, however, are specific-to a-particular-language. The-following-narrative is limited to-English-language, as it-is the de facto language of scientific-communication.

4.3. English, as ‘de facto’ language, of scientific-communication

55% of the-respondents confessed, that they are not very-confident, in their-ability, to-write (for scientific-papers) in-English.

Language is the-vehicle, for scholarly-communication (Jaygbay, 1998). Scientific-writing, in-English, started in the-14th-Century (Taavitsainen & Pahta, 2012), and currently English, has-become de facto the-language of science. To-write and publish, in-other-languages, restricts an-author’s potential visibility to a-small-
fraction, in-comparison of that, when the-article is written, in-English. Almost-all scientists, whatever their-native-tongue, have no other-alternative, but to-learn-English, to-discover what other-scientists are doing, and to-be a-part of the-scientific-community, in-their-field. However, if English is one’s-second or, even, third-language, the-writer, probably, not as-familiar, as-native-English-speakers, with the-vocabulary and expression, of the-language and, therefore, feel-hesitant about writing-freely, without assistance of proofreading-services, which, in-turn, necessitate additional-time, and expense, to the-writer, in-question. Moreover, Starovoytova & Namango (2017a) cited Vasconcelos (2009) and Roig (2008), who pointed-out, that English, as a-second-language, is a-stimulus, to-plagiarize.

On the-other-hand, English-language has variant-spellings; i.e. many-words can-be-spelled ‘correctly’ in more-than-one-way. Many of these-variations are due to-the-differences, between-the-British and the-US-forms of spelling. Some-mixed-forms are also-used; e.g. Canadian-English, that has elements of both; the-British and the-US-styles. None of these-forms, however, can-be argued, as ‘the-only-right’ form. This can-cause puzzlement, especially for those-of-us, whose-first, or even-second-language of communication, is not English. The-best and easiest-way-to-overcome this-problem is, simply, to-follow journal’s-style and Instructions to Authors.

Besides, the-English-language recognizes 3-genders: feminine, masculine, and neuter, which can-be identified by-the-choice of the-appropriate-pronoun (he, she, or it). Authors should-avoid any-gender-bias, in their-writing. Using ‘he/she’ or ‘his/her’ avoids the-gender-bias; however, that-sort of sentence-structure is tongue-tied. Using ‘they’ instead of ‘he/she’ in-such situations is now-becoming widespread, for-example: “Everybody should-be-aware of their-responsibilities”.

Another-issue of importance, in scientific-writing, in-English, is the-use of jargon. A-jargon is ‘a-mode of speech, familiar only to-a-particular-group or a specific-profession’. Each-discipline has its special ‘language’ and technical-terminology, that may-be-understandable to-member of that-discipline, but not-necessarily, to-others. In-engineering, in-particular, this is very-prevalent; for-example, Starovoytova (2015) pointed-out that TRIZ-inventor, G. Altshuller saw, that science and technology, had become a Tower of Babel. Each wrote in their-own-scientific-language, and technical-terminology, and similar-problems were-solved, with analogous-solutions, with huge-duplication of work. Authors, therefore, have-to-be careful about the-use of such-jargons, particularly, within multidisciplinary-research-framework.

The-English-language is a-universal-tool, which enables scientists, to-share-results, of their-research, with the-international-scientific-community, and hence proficiency, in-English, is paramount. Writers use different-approaches to-acquire sufficient-English-proficiency. For-example, Goryanova et al. (2015), in-their-study, pointed-out on an-interesting-approach used, in one-of-the-National Research Universities, in-Russia, to-design and deliver a-92-hours-course on ‘Writing for Publication’. The-two modules of the-course (‘Structure, Content and Style of Scientific Research Articles’, and ‘Grammar Peculiarities of Writing Scientific Research Articles’) were delivered, by an-English-native-researcher and writer, while third-module (‘Coherence and Cohesion in Writing Scientific Research Articles’) was offered, by a-Russian-scientist and writer. The-course, is proven-to-be-successful, for-fine-tuning, of writing-skills, and raising-awareness, on the-structure and organization, of scientific-research-articles (in-the-14 covered fields), as-well-as, proper-language-use, in-the-context of scientific-writing.

Readers, interested in-the-improvement, of their-English, can-refer to Word Power: English language skills, led by-qualified native-speaking English-language-teachers, and also check the-following websites: (1) www.engvid.com; (2) www.youtube.com/results?search_query=english++with+jade; and (3) www.bbc.co.uk/learningenglish, among-others.

4.4. Micro-issues of writing
4.4.1. Grammar and spelling
Scientific-writers are frequently-accused of being-pedantic about spelling, grammar, and punctuation. Their-doctrinaire, probably, justifiable, as effective-scientific-writing requires expressing one-self clearly, accurately, and precisely; to-this-end, good-grammar, proper-spelling, and appropriate-punctuation, are paramount. Besides, incorrect-grammar might lead to-the-rejection, of manuscripts, from reviewers (Pearce, 2003).

The word ‘grammar’ is derived from Greek γραµµατικὴ τέχνη (grammatikē technē), which means ‘art of letters’, from γράµµα (gramma), ‘letter’, itself from γράφων (graphein), ‘to draw, to write’ (Harper, 2010). In-linguistics, grammar is the-set of structural-rules, governing the-composition of clauses, phrases, and words, in any-given-natural-language. The-term refers also-to-the-study of such-rules, and this-field includes: morphology, syntax, and phonology, often-complemented-by phonetics, semantics, and pragmatics.

In-particular, syntax is the-technical-term, for the-rules, governing-the-way words, in any-language, are-put-together, into-sentences. Syntax is particularly-important in-English, where a-small-change in-word-order, could-completely-change the-meaning of the-sentence. For-example: ‘The-doctor saw the-patient’ is different-from ‘The-patient saw the-doctor’. The-rules of syntax are notoriously-complex, in English-language, and hence,
are outside of the scope of this concise paper.

Spelling is important, for exactly the same reason, that grammar and punctuation are important. Incorrect spelling makes for poor communication, in scientific writing, as it requires a high degree of accuracy, to express the message. It also reflects the possible negligence, on the side of the writer(s), lowering the quality of the entire piece of work. To improve clarity, conciseness, and cohesion, a writer should: (1) Omit unnecessary words; (2) Put actions, in verbs (avoid nominalizations); (3) Place verbs near subjects; and (4) Put familiar information, first (Duke Scientific Writing Resource, 2011).

Besides, to make the text more organized, and hence, a research article more appealing, the text, of each of the discussed above sections, should be separated, in sub-sections or signposts, which can be arbitrary, but they, do improve, dramatically, the structure of a paper. One thing to remember, is that sub-sections should only be used, when there will be more than one sub-section. On the other hand, readers, generally, respond well, when sentences have a varied length and when paragraphs have a consistent length; the former, however, not always possible.

Within sections, each paragraph should also have a well organized flow. They should have a key sentence, supporting sentences, and a concluding, or summary sentence (Gray, 2003). On the other hand, paragraphs should be interconnected, with good transition statements. Conjunctive adverbs, such as: therefore, hence, thus, consequently, and however, among others, are worthy tools, to force a conclusion to develop. By following this format, paragraphs will be clear, convincing, and easy to organize.

Moreover, sentences in academic books and journals, can be quite complex, made up of, one or more, subordinate clauses, joined in various ways, including conjunctions or relative pronouns, or linked through punctuation. The basic rule remains the same, however: one complete idea, one complete sentence.

Many books, on English style and grammar checks, in word processing software, recommend the use of active voice, because passive voice, possibly, will make the text monotonous and boring, add words, reduce impact, and, even, cause confusion. When writing the article, the active voice (he said, we derive, they found) is preferred, to the passive voice (was communicated by, is derived as follows, was found by). In scientific writing, the passive voice is often, more convenient and sometimes, is even unavoidable. Wherever the active voice is used, however, the sentences appear stronger, more convincing, and much clear. Moreover, Webb (2001), also points out, on another important factor, to consider, when writing. The factor is the preference, for writing, in the first person (personalized), third person (distant) or passive voice (assumed) perspective.

Furthermore, Straus (2008), in his study, pointed out, that some scientific writers use unnecessarily complicated way of expression, by so called verbosity (a form of wordiness, with a lot of words, usually, to make it sound more important and extra intelligent). The primary purpose of a scientific paper, however, is to inform readers, and not to impress them, with the writer's affluent vocabulary, and smooth lexicon skills.

4.4.2. Punctuations

Writing looks, a lot like having a blindfold, over a writer's eyes, with no ability, for them, to see, exactly, whom they are talking to. Separated from the audience, in place and in time, writers cannot see their audience, to test how their communication is being received, or if there will be some kind of response. The words on the page are silent, so a writer must use word choice and punctuation, to communicate the tone of a message (Irvin, 2010).

The 14 punctuation marks in English language (period, question mark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipses) may connect, divide, enclose, indicate omissions, and organize sentences; most of them can perform more than one function. The use of punctuation is determined by grammatical conventions, and the writer's intention. Some writers do, and some do not provide any attention, and do not give, any weight to punctuations. On the other hand, these of us who do, strongly believe, that punctuation, undeniably, substitutes for the writer's facial expressions.

One particular type of punctuation marks, a hyphen, deserves a more closer look. A reader of this paper, probably, already observed, that hyphen is used substantially, by the authors. Although the hyphen functions primarily as a spelling device, it also functions to link and separate words. The most common use of the hyphen is to join compound words (Examples: able-bodied, self contained, sister in law); Occasionally a hyphen (or dash) replaces the preposition to (0–100 for: from 0 to 100); A hyphen is used to form compound numbers from twenty one to ninety nine and fractions, when written out (e.g., twenty seven, one tenth); Hyphens also used with modifiers, where: (1) a hyphen used to join words, used as a single adjective (e.g., four year old tree [NOT four years old tree] or four year old trees; (2) Two word and three word unit modifiers, that express a single thought, are hyphenated, when they precede a noun (an out of date car, a clear cut decision); (3) If each of the words can modify the noun, without the aid of the other modifying word or words, a hyphen is usually, not used (e.g., a new digital computer—no hyphen); (4) if the first word is an adverb, ending in ly, a hyphen should not be used (e.g., a hardly used computer; a highly desirable event); and (5) with the prefixes ex self and all; with the suffix elect; and with all prefixes, before a proper noun or proper adjective (e.g.,
been expressed, in-writing (Straus, 2008). The majority of quotations in academic work will, therefore, require

president-elect). It is worth, to-emphasize, however, that hyphens can drastically-change the-meaning of the-sentence; thus, writers should use them accordingly—with caution.

On-the-other-hand, each-word, in a-sentence, can-be defined, by-the-role, it-plays. The-different -roles are known as ‘parts-of-speech’. Incorrect-use of speech-marks, are still, one of the most-misused punctuation-marks. In-most-disciplines, speech-marks should only be-used, when something is—being said, not when-something has—been-expressed, in-writing (Straus, 2008). The-majority of quotations in academic-work will, therefore, require inverted-commas, and not speech-marks; though the-reader(s) should-check, the-conventions, of their-discipline, to-confirm this. Moreover, according to University of Essex (2008):

The difference between speech marks (sometimes called “double inverted commas”) and inverted commas (‘single inverted commas’) is very-simple. One-way to-distinguish-them is to remember, that speech—requires the-physical-presence of two-people, a-speaker and a-listener, hence it needs double—inverted-commas: “speech-marks”. When something is being-referenced from a-book, however, only one-person is present (the-reader), hence ‘single inverted commas’ should-be-used.

This-rule, however, is not very-commonly, applied, by-the-authors, probably, because of lack-of awareness, and hence, understanding; moreover, many of widely-accepted Reference-styles, require, that the-titles of articles, published in-refereed-journals, should-be put in “speech-marks”, which is, according to-proper-English, is incorrect.

Writers, wanted to-cross-check the-correctness of English-language, in-their-scientific-manuscript, can go to: www.whitesmoke.com; or www.reverso.net/spell-checker/english-spelling-grammar.

Besides, knowing only macro- and micro-elements of scientific-writing (presented in two-previous-sections) is not sufficient, to become an-effective-writer. The-following-narrative, hence, provides some-additional-angles, on the-subject-matter.

4. 5. Good research-paper and competent-scientific-writing.

55% of the-subject-sample revealed, that they have a—rather-vague-grasp, on what really constitutes a good—research-paper, and a-fine-scientific-writing. Both-concepts, on-the-other-hand, are related, as good—research-paper is a-product of ethical-research, and fine-scientific-writing; both, incorporating aspects of quality, and quality-management.

Peer-review is the-main-mechanism, of scientific-quality-management, where submitted-papers are reviewed, by-peers-experts, prior to-publication. With-regard to the-writing-style of the-manuscript, the-following-characteristics are-relevant to-reviewers, and might-influence their—recommended—decision: (1) clarity of writing: readability, organization, conciseness, and technical-quality, of the-paper; (2) suitable—title and abstract; (3) appropriate-use, of well—designed—figures, and accurate-tables; (4) sound—conclusion and discussion; and (5) length of the-paper, relative to-its-usefulness. Additional-factors might—also increase the-likelihood of a—manuscript—acceptance (Yuksel, 2003), such—as: (1) strong—reputation of the-author; (2) successful—test of the—proposed—theory; and (3) unusual—content, from that usually—published, in—the-journal.

To-produce a—well-written—scientific-paper, scientific-writing must—be—precise; which requires an—advanced—level of detail. Meticulous—description of objects, forces, methodology, etc., can easily—lead to—rather—complex—sentences, expressing too-many—ideas, without a-break—point, that—is—difficult to—follow and, is—likely, to—be confusing. To-avoid very—long—sentences, it is advisable ‘to-cut the-snake’, by—splitting long—sentences into, logically-connected, shorter—ones. On—the—other—hand, sentences, that are too—short, and poorly—connected, can—be bothersome, to—read. As—a—general—rule, there should—be no more—than 20—25—words, in any one—sentence. Another—postulate is that, there—should—be one—message in a—sentence, not more, not less. Furthermore, signaling and linking—language should—be used, to—enable smooth—transition, between sentences and paragraphs. Besides, good—scientific-writing is: (1) impartial— it avoids making assumptions (Everyone knows that . . .) and unproven statements (It can never—be—achieved . . .). It presents how and where data were—collected and supports its—conclusions with evidence; and (2) accurate— it—avoids vague and ambiguous—language, such as: about, approximately, and almost (Eunson, 2009).

In—addition, scientific-writers should—not—be—afraid to—be—critical, of other—people’s works and ideas. Healthy and constructive—criticism are ‘part and parcel’ of everyday—academic—life; hence the—critical—point of view, should—come—across, to—the—reader, as a—justified and well—articulated—case, and not simply, as an—opinion. Effective and mature—scientific-writing is, essentially, persuasive or argumentative—writing, that follows the—rules of formal—rhetoric (which, many of us, probably, have—never—been—taught). Persuasive—writing is where one has to—write to—prove a—point, to—change someone’s—opinion, or to—clarify an—issue. Generally, a—writer is arguing a—point, with the—goal of convincing—someone that their—position is correct. Rather than—a—shouting—match between—two—disagreeing—sides, argument instead means a—carefully—arranged and supported—presentation of a—viewpoint (Thaiss & Zawacki, 2006).

Moreover, being—critical is not—just about tearing—apart, the—work of others. Adopting a—critical—stance, to a—
text, means paying-close-attention to-the-text, in-terms of definitions, ideas, assumptions, and findings, or arguments. It-is focused-questioning and interrogation, which-is respectful of what-others-have-done and contributed (Kamler & Thomson, 2006). Besides, each-one of us, as-writers, approaches a-subject-matter, from a-distinctive-individual-perspective, reflecting the-educational- background, level of intelligence, individuality, philosophical-values, or life-experiences. There-is no absolute-expert-authority, a-researcher or an-intellectual; whose-input is so-perfect, accurate, complete, or indisputable, that the-rest of us, can no-longer give-opinions, on the-topic. In-order-to-construct a-strong and logical-argument, Leki (1998), points-out on-the-importance to-avoid these-widespread-mistakes, such-as: (1) Exaggeration and un-substantiated-generalizations; (2) Over-simplification, of your-argument, or of the-opposing-argument; (3) Logical-flaws; (4) Appeals to-inappropriate-authorities; (5) Emotionally charged-words; and (6) Out-of-date facts.

As a-skill, writing is a-complex-task, in-itself, but it-is-made all-the-more-challenging, due to-the-specialized-nature, of academic-discourse. Academic-writing differs from other-types of writing, such-as journalistic or creative-writing. Both-forms of writing (scientific-papers and popular-science articles), however, must-fulfill the, so-called, ‘ABC’ of communication (accuracy, brevity, and clarity). In-most-forms, of academic-writing, a-detached and objective-approach, are required.

In-particular, although engineering-education tends to-be rather-explicit, in-terms of expressing technical-ideas, many-process-aspects of education and research, tend to-be-implicit. This-is predominantly so, with-regards to scientific-engineering-writing (Rosales et al., 2012). Writing, in-engineering, is an-important-part of research, and thus writing is, first of all, thinking, as according to Barzun & Graff (1977) ‘Writing requires that we create some-order in our-thoughts and project it outside, where everybody can see it’. Writing-should-be also a-creative-process; and not just dry-technical-reporting, but a-story telling (Schimmel, 2012; Anderson, 2011; Montgomery, 2003), connecting-relevant-information, in-a-logical- narrative. Good-writing-style is also, naturally, more-understandable, and enjoyable, to-read.

It-is also-recommended, to-avoid ‘filling the-River-Nile in a-small-bowl’ by getting-too-wordy, or with over-statements, as, in-reality, only-a-few-studies can-make real-discoveries and innovations, which can-change the-course of engineering, or any-other-discipline, for that-matter. According to an-article by Staroyoytova et al. (2015), the-most-interesting-concept of the Theory of Inventive Problem Solution (TRIZ), is that 99.7% of inventions utilize already-known solution-principle, and considered-to-be mere-improvements, to-existing-systems; only less than 0.3% is truly-pioneering, ground-breaking inventions, or scientific-discoveries.

Another-important-element, of-scientific-writing, is uniqueness, which manifests in-the writing style, and personal-voice, of a-writer. Voice is a-difficult-concept to-define, but developing a-voice is an-important-aspect, of becoming an-effective-writer. Every-piece of scientific-writing has a-voice; voice refers to-the-way one-reveals-themselves, to-others, when one writes (Richards & Miller, 2005). According to Mulvaney & Jolliffe (2005), voice may-be-thought of as:

- a combination of the-personality of the-writer, that comes-through, to-the-reader; the perspective the-writer-assumes, often influenced by-the-audience being addressed, as-well-as by the purpose and previous-level of knowledge … and the-tone of the-passage. For a ‘greenhorn’-writer, however, it can-be difficult, to-find and to-express their-voice.

It-takes self-confidence; continuous and regular-writing-practice; time; patience; great-attention to-details; and numerous-revisions, for a-writer, to-develop a-distinct and recognizable-voice, in-scientific community.

On-the-other-hand, the-required-qualities, of good-research-paper, alongside its-presentation, are as-follows: (Lester & Lester, 2015; Eunson, 2009; Fitzmaurice & O’Farrell, 2009; Finkelstein, 2004; Anderson, 2003; Derntl, 2003): (1) Rigorous: Research is a-laborious-hard-work, and it-requires great-patience and control. Research-paper requires rigorosity, to-maintain its-quality; (2) Controlled: it-should-have to-be-controlled or measured. Everything, that added, in-a-research-paper, is pre-planned and cannot happen, just by-chance; (3) Accurate: Accuracy is imperative, because without it, a-research-paper cannot be-valid and generalize-able. In every-step of the-research, the-researcher has to-cross-check the-accuracy; (4) Clear: A-research-paper should-have to-be-free of ambiguities and it-should-have great-clarity. Clarity is one of the-main-essences of research; in its absence, the-research-paper is worthless; (5) Concise: Writers should-try-their-best, to-add only relevant, original and interesting-content, to-make the-paper distinctive and appealing; (6) Valid: The-actual-strength of a-research-paper is its-validity. A-valid-research is applicable, to-various-situations, in-general, or it-can-be applied to-a-specific-situation, people, or society; (7) Verifiable: The-data, in-a-research-paper, should have-to-be verifiable and provable; there should-be no loopholes, in-the-information; (8) Sequential: A-research-paper should-be-written in a-logical-manner; (9) Precise: A-research-paper should-have-completeness, and it-should contain detailed investigation, of-the-research-topic; (10) Original: A-research-paper should-present original-content, supplemented by properly-referenced-information, from other-sources; (11) Coherent: Every-part of a-research-paper should-be-linked, to-make a-whole-piece; (12) Generalize-able: The-research-paper findings should-be generalize-able and the-findings should-be-applicable, to-the-society, in-one-way, or the-other; (13) Specific: Research-topic is generally-based on some-problem or a-relationship, between variables; this-problem
should be specifically stated. For example “The impact of gender on graduation outcomes”, in this statement the variables are clearly defined. There could be further segregation of the variables, but it should be stated specifically; (14) Measurable: Certain research-analysis instruments, such as SPSS-tool, or some physical instruments, like spectrophotometer etc., or data collection tools (based on the research requirements), such as questionnaires, annual reports etc., should be used; (15) Attainable: The data, required for the research, should be attainable and available; (16) Realistic: The analysis and results must be realistic; they should not be manipulated. The proposed hypothesis, for the research, would be either accepted or rejected; and (17) Properly Formatted: There is a certain format to follow, usually, so-called journal’s ‘house-style’ (mentioned earlier, in this paper).

In addition, they say, that “no matter how many panels a person stack on top of each other, they still need nails, to prevent the pile, from falling apart”. The same logic applies to a scientific writing. Tiny things, such as flow, structure, voice, and word choice, will connect the story, clean and polish the paper, and make it enjoyable, to read (Turbek et al., 2016). Besides, scientific papers cannot just happen, unless they are given a priority, in life. To achieve this, it is important to develop good time-management skills, that enable a writer, to distinguish between, the urgent and the important issues, in one’s working day (Covey, 1994). Furthermore, it is paramount, for authors, avoiding any ‘scientific misconduct’, to keep away from rejections, retractions, loss of job; revoked awards and degrees; lawsuits, questioned-integrity; loss of grant money, or even jeopardizing their reputation and destroying their career. Interested readers can refer to Starovoytova & Namango, 2017a; and Starovoytova & Namango (2017b), for more details on scientific misconduct.

Furthermore, many academic researchers, do, constantly work, on refining their writing skills, throughout their careers. Even for professional scientists and researchers, there is always room for improvement, to write more effectively (Turbek et al., 2016).

Focusing on the strategies for success, laid out, in this paper, will not only improve writing skills, for writers at any stage of their career, but also make the scientific writing process easier, more efficient and enjoyable. However, readers should keep in mind that there is no magic recipe, to write a scientific paper, and as one gains experience with scientific writing, one will begin to find one’s own voice.

As a final point, the author, wishes to quote Albert Einstein, who once said ‘A person who has never made a mistake has never tried anything new’. On the other hand, Benner (2001) in his study, pointed out on five levels of development, in scientific writing: (1) Novice; (2) Advanced-Beginner; (3) Competent; (4) Proficient; and (5) Expert. In the same spirit, to become an effective and successful writer—an expert, authors should strive reading and writing daily. Research has shown that those writers, who write 30 minutes, every day, are 5 to 10 times are more productive, than those, who wait, for extended periods of time, in which to write (Gray, 2003). Besides, Grympna (2007) once said ‘... the best writing comes from an internal need to write rather than simply from an external need to publish’. Therefore, academicians should write often and write freely, make their mistakes, learn from those mistakes, gain experience, and hopefully, eventually, become original, interesting, and successful writers.

5. Conclusions
This study revealed, that the respondents have experienced difficulties, in scientific writing and publishing; in particular, in the following areas: (1) structuring of a scientific paper; (2) writing particular sections of a scientific paper; (3) rejections and how to deal with them; and (4) English language of scientific writing.

It is not a secret, that everything is simple and straightforward, when one knows how to do it; the skill of academic writing is not an exception. Successful writing is all about precise, suitable, logical and recognizable expression, of one’s thinking. Some academicians, however, perceive scientific writing as a distinct, unnatural, and eccentric language. To demystify this misconception, the author trusts, that this article proves practical and valuable, for academic fraternity, in future writing, for any scientific journal, by, hopefully, easing the transition, when facing daunting writing challenges. Besides, effective scientific writing should be cultivated at an early stage of the career. This work, therefore, should be particularly useful, for ambitious beginners, seeking to join the publishing scientific community. Nevertheless, it is, expectantly, also useful, for writers, at all stages in their education and careers, including, those scientific writers, working for industry and governmental institutions.

To become a successful writer, authors should strive to demonstrate excellence, comprehensive understanding of the topic, insightful analysis, that leads to a compelling argument and signifying original or independent thinking, with time, trained to manifest, as a distinct voice. Moreover, good time management skills, ethical values, and complete dedication, are paramount. Studies, conducted with scientific correctness, and reported, with quality, logically, have better chances, to be published and cited, in high impact journals, giving recognition and visibility, not only to authors, but also to their institutions, and effectively contributing to the overall development of Science and Engineering.

The scope of this article covers only the basics of research writing; advanced aspects can be accessed, for-
example, via the-ICMJE-website (www.icmje.org).

6. Acknowledgement
The author wishes to acknowledge the fellow-colleagues, SOE, MU, who participated in this concise study, for their: time, conceptual-support, and peer-interactive-communication, expressed throughout the study.

References


Gray, T. (2003). Publish and Flourish: Write well and revise rapidly, Workshops by Gray—She’s anything but gray, New Mexico State University.


Starovoytova, D. (2017 c).”Scientific Research, Writing, and Dissemination: (Part 2/4) - Barriers to Effective-Research, at Engineering-School”, *Journal of Education and Practice*, ISSN 2222-1735 (Paper), ISSN 2222-288X. Vol.8, No.25


