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Research-Productivity at Engineering-School: Number of Publications per Faculty-Member

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Abstract
Research-productivity has-been attracting a-lot of attention, globally, among scientists, researchers, administrators, and policy-makers. The-present-study was conducted at-micro-level (sample-size 15), to-evaluate total and average annual-research-productivity, of individual-academicians, in an-Engineering school, over their-publication-career (from the-year of their-first-publication, through 2017). Moreover, research-productivity was-evaluated against: academic-rank, teaching-experience, age, gender, and the-field of engineering. Publications, in-peer-reviewed-scientific-journals, were used, as a-proxy, for research- productivity. Questionnaires, interviews, and document-analysis were the-main-instruments, for this-study. Descriptive-statistics was-used, to-analyze both; qualitative and quantitative-data, *via* EasyCalculation- software. The-obtained-data was analyzed, by SPPS-17(version 22). Moreover, to-bridge knowledge-gaps, the-following-issues were looked-into: The-role of universities in-research and development; Trends of scientific-publications; Challenges in-research and publishing, at the-African, and local-context; Basic-concepts and measurements of Research-productivity; and Reading-culture. The-study, revealed, that the-sample-faculty published, cumulatively, 230 papers, over their-productive-publishing-career. The-most-productive, with the-highest-average-number of total-publications, were: (1) Associate-professors, with 31.5; (2) Faculty-members, between 51 and 60 years-old, with 37; (3) Female-faculty, with 41; (4) Faculty, having over 25 years of teaching-experience, with 33; and (5) Faculty-members, from Civil and Structural department, with 33 publications. The-analysis also-revealed, that the-identified-average-number of 2.1 publications, per-faculty, per-year, compares-favorably with-estimations, of several-previous-authors; however, examination of research-productivity, at-individual-level, showed great-variations, e.g., the-most-productive-faculty-member (based on-both; total-number of publications, and average-number of publication, per-year), a-*female* associate-professor, reported 41 articles, published-over 4-year-period (2012-2016), giving the-max individual average-number of 10.3 publications, per-year. The-min-number of publications was 8, in-the-period of 9 years (2006-2015), giving the-min individual-average of 0.9 publications, per-year. Besides, if *individual*-faculty is evaluated, for 70 % of the-respondents, their-average-number of publications, per-year, exceeds the-estimations, of one-publication, per-capita. The-study also-identified lack of *any*-international, or national-guidance, or institutional-policy, on how-many-publications, an-average-faculty-member should-produce, per-year, to-provide a-reliable-benchmark, for-comparison. In-addition, several-recommendations were given, for future-research.
Keywords: academic staff, measurement research productivity, reading culture, university.

1. Introduction.

1.1. The-role of universities in-research and development

Research plays a-vital-role, in-promoting the-prosperity, of a-nation, and the-well-being, of its-citizens, in-this knowledge-based-era (Abbott & Doucouliagos, 2004). Universities are-considered as modern entrepreneurial-engines and generators of knowledge, through research, thereby, promoting national and global-development (Okiki, 2013). Mosha (1986), identified three-principal-roles for the-*African* universities: (1) the-promotion of learning, and the-pursuit of truth; (2) preparation for service, including training, for problem-solving; and (3) the-fostering of (applied) research and consulting. Moreover, Braimoh (1999) reviewed the-role of African-universities, in-national and continental-developments; emphasizing-upon the-significance of research and publication-efforts, among university-lecturers, in their-abilities, to-create and disseminate-knowledge, to-solve existing-societal-problems. Majority of research-findings are disseminated *via* scientific-publications, in-peer-reviewed-journals (see Starovoytova, 2017d).

1.2. Trends of scientific-publications.

The-number of scientific-publications grows faster, than the-global-economy, and significantly-faster, than the-production of goods and services, in-industrial-countries, from where the-largest-number of publications originates. The-annual-growth-rate of scholarly-publications is at 5%, at-the-time OECD (2008) was published. According to SBF (2007), the-largest-share of world-production of scientific-articles comes from the-U.S.A. (25%), followed by Britain with 6.9%; Germany produces 6.3%; Switzerland 1.5%; and Austria 0.7%. However, calculating published-articles, per-capita, Switzerland becomes the-world's leading-country, because there are 2.5 published-scientific-articles per 1,000 inhabitants, while in-the-U.S.A. there-are 1.2 articles, and only one-article, in-Germany. The-same-picture emerges if one applies the-number of publications to the-number of researchers. In-this-case, in-Switzerland for each 1,000 researchers there-are 725 publications, while there-are 295, in-Germany, and 240, in-the-U.S.A. (SBF, 2007).

In-more-recent-studies, for-example, STM (2015), there-were about 28,100 active-scholarly peer-reviewed English-language-journals, in-late 2014 (plus a-further 6,450 non-English-language-journals), collectively-publishing about 2.5 million-articles, a-year. The-global-yearly-revenues, produced from English-language journals-publishing, were \$10 billion, in 2013 (up from \$8 billion, in 2008), contributing about 55% from the-U.S.A., 28% from Europe/Middle-East, 14% from Asia/Pacific, and 4% from the-rest of the-world. The-number of articles, published each-year, and the-number of journals has grown-steadily, by-about 3% and 3.5%, per-year, respectively. The-U.S.A. continues to-dominate, the-global-output of research-papers, with a-share of 23%, China is second (17%), followed by UK (7%), Germany (6%), Japan (6%), and France (4%). The-rank-order changes, for-citations, however, with the-U.S.A. strongly in-the-lead, with 36%, and China at 11th place, with 6%.

Moreover, recent-study by Van Noorden (2014) declares, that global-scientific-output doubles, every nine-years. Articles are also-getting-longer, for-example, Tenopir & King (2014) found that the-length of a-scientific-paper grew-from an-average of 7.42 pages, in 1975, to 14.28 pages, in 2011. Besides, according-to Tancheva *et al.* (2016), researchers also-complained, about information-overload and too-much-literature, to-read, and therefore, time-required, to-adequately-cover an-introductory-literature-review.

Even in-developing-countries, the-proportion of scientific-publications, in-recognized bibliometric-databases, have increased-markedly. In 1973, developing-countries, as a-whole, accounted for 5% of the-world's scientific-publications; and only India, South-Africa, and Argentina, made the-list of top 25 countries (Garfield, 1983). In 2006, scientific-publications, from developing-countries, accounted for 20% of the-global-share, largely due-to Asia (14.8%) and in-particular to-China (7%). China experienced a-growth, in-publications, of over 100% in the-last decade, while in-Latin-America, Brazil has-increased its-contribution, to-global-publications, by almost 50%, during the-same-period (Gaillard, 2010). On-the other-hand, according to-the-*Bulletin on-Science and Technology-Statistics, of* the-UN-Institute of Statistics' (UIS), the-whole-continent of Africa contributed *only* 1.4%, of the-world-scholarly-publications, in 2000 (UIS, 2005). In-some-African-countries, research and publishing-activity may present some-methodological-challenges.

1.3. Challenges in research and publishing, at the-African and local-contexts.

According to Ondari-Okemwa (2007), scholarly-publishing, in *sub-Saharan-Africa*, is faced with many-challenges, in the-21st Century, such-as: lack of visibility and, even, alleged-discrimination, particularly, in-citing, of African-authors. Publications, from periphery-countries, rarely-rise to-the-same elite-status, as those of North-America and Europe, primarily, because of-perceived lower-research-capacity and relative-inexperience (as scientific-publishing does *not* have a-long history, in-the-African-continent, and in-sub-Saharan-Africa, in-particular). In-addition, there is also-alleged-lack of interest-to and relevance, of African-problems, to-outside-readers. These-*alleged*-attitudes might-subdue the-voices of periphery-scholars and prevent their-contributions, to-collective-knowledge.

Moreover, an-important-reason for low-research-outputs is closely-related, to the-high-rejection rate of manuscripts, especially-those by first-attempt-authors. Worsham (2008) confirms that the-acceptance-rate, of any-good-scholarly-journal, is-typically, quite-low, so, the-chance of rejection is always-relatively-high. Summers (2001), mentions that the-rejection-rate of leading-International-research-journals, currently-averages, around 90%. A-study by Kapp & Albertyn (2008), among the-editors of 73 accredited, South-African-journals, also-confirmed an-exceptionally-high rejection-rates. Moreover, recent-study by Starovoytova (2017c) pointed-out on commonality of rejection-experience, that 'Majority of respondents (64%) indicated that they have-experienced rejection, in-their publishing endeavors'.

In-addition, the-great-majority of mainstream-academic-journals is-written, in-English; multilingual periphery-scholars must-translate their-work, for their-papers, to-be-accepted (Canagarajah, 1996); this-demands additional-time, English-language-proficiency, and/or finances (in-case of outsourcing, of a-translator, or a-proof-reader). See Starovoytova (2017c) on *'English, as 'de facto' language, of scientific-communication'.*

While research-environments, in-most of the-developed-world, are-characterized by an-abundance of resources, and supporting infrastructure, the-same does *not* apply to-much of the-developing-world (Luo & Olson, 2008; Duque *et al.,* 2005). For-example, Muriithi (2013), in her-Doctoral-dissertation, surveyed problem-areas in research and publication, among-sample of 248 academic-members of staff, in four-disciplines, across four-major Kenyan-universities. The-surveyed 17-problem-areas, were: Availability and access to-special-equipment, Ease of getting funding, Amount of funding, Administration of the-funding, Availability of skilled-personnel, Defining roles, Coordination of member's activities, Timely-delivery of results, Diverse disciplinary-training of collaborators, Cultural-differences, Resolving-conflicts, Scientific competition, Information-security, Authorship-inclusion and order, Selection of a-publication-forum, Leadership and control, and Availability of time, to-commit to-research. Their-study concluded, that major-problem is the-ease of getting funding (76%), amount of funding (79.1%), availability and access to-special-equipment (67.8%), and availability of time, to-conduct research (58.4%).

Furthermore, more-recent-study by Starovoytova (2017b), on-the-Engineering-school (the-subject of this-research), stated, with brutal-honesty, that:

The-main-finding, with *no*-fear of exaggeration, is that the-current-state of scientific-research, at the-institution, can-be-perceived as '*a-crisis in-the-making'*. The-profound-lack of, or in-some- cases, non-existence, of essential-ingredients for effective-research, were-identified, and can-be grouped-into: (1) *Economic* (inadequate-funding, for research and research-infrastructure; low- remuneration; and self-sponsored-publishing); (2) *Institutional* (lack of Code of Practice, for Researchers; and mushrooming campuses); (3) *Behavioral* ('publishing-prostitution'; 'brain- drain'; 'complex of intellectual superiority'; and lack-of time, motivation, recognition, and mentorship); (4) *Demographic* (gender-imbalance; and aging-faculty); and (5) *Managerial* (lack of marketing of library-services, and training, for-technical-staff), among-others. In- particular, absolute-majority (100%) of respondents pointed-out on the-Research-Funding and Low-remuneration of teaching-staff, as major-barriers to effective-research. 82% also-indicated lack of the-following: (a) Laboratory-testing-equipment; (b) Severe-shortage of staff, due to freezing of new-recruitments and '*brain-drain'* (c) Free-time, to-do-research; and (d) Reliable and fast- Internet-access, in the-office.

In-spite of the-numerous and persistent-difficulties, faculty-members, of the-school, *do* strive to-publish. The-next-sections will-be introducing basic-concepts and measurements of research-productivity.

1.4. Basic-concepts of Research-productivity

In-higher-education, research-productivity serves as a-major-role in-attaining-success, in-academics-circles, as it-is-related to: promotion, tenure, salary, and other-benefits (Bassey *et al.,* 2007; Kotrlik *et al.,* 2002; Bloedel, 2001).

According to Creswell (1986):

research-productivity includes research-publications in professional-journals and in-conference-proceedings, writing a-book or chapter, gathering and analyzing original-evidence, working with post-graduate-students on-dissertations and class projects, obtaining research-grants, carrying-out editorial-duties, obtaining patents and licenses, writing of monographs, developing experimental-designs, producing-works of an-artistic or creative-nature, engaging in-public debates, and commentaries.

Besides, Massy & Wilger (1995) define productivity as the-ratio of outputs-to-inputs, or of benefits to costs. Meyer (1998) also-distinguishes productivity from workload and time-allocation: 'Workload . . . captures how their [the faculty] time is spent, while productivity is a measure of what is produced with that time'.

Academic-staff-members conduct research and their-research-productivity is measured in-various ways. Academic-institutions primarily measure research-productivity, based on: (1) published-works; (2) externally-funded-grants, (3) the-number of citations, the-published-works received, and (4) the-impact-factor, of the-publishing-outlet (Middaugh, 2001). Different-types of published-works were identified, such-as: book or book-chapter, peer-reviewed journal-articles; policy-briefs; press-releases; institutional-newsletter; video-clips; brochures; Facebook Twitter/Google+; Podcasts, YouTube, slide-shares, blogging, and Online-Reference-Managers, among-others (see Starovoytova, 2017d; Vakkari, 2008; Bassey *et al.,* 2007; Kusure *et al.,* 2006; Torchich, 2006).

A-number of studies have-tried to-compare research-productivity, across-countries, or academic- disciplines, and to-explore the-main-factors, which enhance the-research-productivity, of faculty-members (Shin & Cummings, 2010; Horta, 2009; Stephan & Ma, 2005; Keith *et al.,* 2002; Baird, 1991; Allison & Long, 1990). According to Porter & Ambach (2001) faculty-productivity can-be grouped-into: (1) individual-demographics; (2) teaching-load; (3) academic-status; (4) personal-career-preferences; and (5) dimensions of human-capital (knowledge, skills, values, education, and training). Several-authors (such-as: Fairweather & Beach, 2002; Porter & Ambach , 2001; Long, 1990; and Golden& Carstensen, 1992), also-pointed-out on interaction of factors, such-as: additional-funds, received; size of academic-department; number of high-achievers; and mentor-experiences, in one's early-career.

In-particular, number of publications, per-researcher, may-depend on various-factors, such-as: gender, age, academic-position and rank, availability of research-funds, teaching-loads, equipment, research-assistants, workload-policies, department-culture and working-conditions, size of department, and organizational-context (Dundar & Lewis, 1998; Ramesh & Singh, 1998; Kyvik, 1993).

Differences in-research-productivity have-been-also-explained, in-terms of individual-background (e.g., ambition, motivation, and self-esteem) (Bellas & Toutkoushian, 1999); previous-experience (e.g., doctoral-training, reputation of doctoral-program, post-doc-experience) (Horta, 2009; Stephan & Ma, 2005); institutional-characteristics (e.g., mission, colleagueship, governance, and reward-system) (Keith *et al.,* 2002; Golden & Carstensen, 1992); and disciplinary-context (Shin & Cummings, 2010; Cresswell, 1985). Regarding disciplinary-context, Biglan (1973) grouped academic-disciplines into: (1) hard *vs.* soft; (2) life *vs.* non-life; and (3) pure *vs.*

applied.

1.5. Measurements of research-productivity of an-individual-faculty-member

Reputation of an-academic-faculty, most of times, is associated-with so-called 'productivity' or publication-performance. Publications, in a-peer-reviewed-journal, are an-important-measure of performance. Increasingly, it-is-vital, for-faculty, to-develop, and maintain, a-prominent and continuing-publication-track-record (Schneider& Whitehead, 2012).

In-the-recent-past, the-researcher's input was-measured, simply, by the-number of publications, and the-impact-factor (IF), of the-publishing-journals. Nowadays, rating research-quality relies, mainly, on the-number of citations, per-article. Citation shows how-many-times an-article has-been-cited, by other-articles (Fooladi *et al.,* 2013). *Citation impact* quantifies the-citation-usage of scholarly-works (Moed, 2005), and it-is a-result of citation-analysis, or bibliometrics. Among the-measures, that have-emerged, from citation-analysis, are: the-citation-counts, for an-individual-article, for an-author, for an-academic-journal, for an-affiliated-institution, and for a-country. Readers, interested how-to-increase citation-rates, of their-publication, could refer to Starovoytova (2017d).

On-the-other-hand, the '*publish or perish*' attitudes impacts academic-career-development-systems, at a-large-number of universities (Lichtenberg, 1997) and research-centers, all-over-the-world. For-illustration, the-Medicine-department, at-the-Imperial-College, insists that its-members 'publish three-papers, per-annum, including one in-a-prestigious-journal, with an-impact-factor of at-least-five' (Forgues & Liarte, 2013). Such-requirements can-be immensely-stressful, for some-researchers, particularly in-the-absence, of funding and conducive-environment, for the-research. The-obligatory 'publish or perish' customs, also-perpetuate bias, in-academic-environment. For-example, **C**amille Paglia has described the 'publish or perish' paradigm, as '*tyranny'* and further writes that 'The [academic] profession has become obsessed with quantity rather than quality. [...] One brilliant article should outweigh one mediocre book' (Paglia, 1991). Moreover, scientific-writers are often-evaluated on-the-basis of the-number of articles, they-have-published, in-journals with a-*high*-IF, favoring prestige, of publication, in a-particular-journal, over content; and quantity, over quality. These-forces are contributing to-the-current-dysfunction, of the-editorial-system, for peer-reviewed-science and engineering, causing a total-stalemate (Delzon *et al.,* 2016).

The-best-known-measures, of research-productivity of an-individual-author, include the *h*-index (Hirsch, 2005), and the *g*-index. Each-measure has its-advantages and disadvantages, spanning from bias, to discipline-dependence, and limitations, of the-citation-data-source (Egghe, 2006).

The-calculation of citation-impact ***h*-index**, for-example, is based on two-types of information: (1) the-total-number of papers, published; and (2) the-number of citations, for each-paper. It-is-defined by how-many ***h*** of a researcher's publications have, at- least**, *h*** citations, each. This-means that if an-author has one-publication, with, at-least, one-citation, their *h*-index is 1, if one has two-publications, with, at-least, two-citations, each, their ***h*-index** would-be 2, and so-on. Beside, two-separate *h*-indices can-be-displayed, for each-author: (1) first is an ***h*-index,** that includes self-citations; and (2) the-second ***h*-index, which** excludes self-citations. Easy-comparison can-be made of the-two-indexes, to-have a-real-number of citations, by other-researchers.

One of the-major-limitation is that the *h*-index varies, among bibliographic-databases (Sharma *et al.,* 2013). In-other-words, the-same-author will-have a-different *h*-index*,* depending on which-database, one uses, to-define its *h*-index.

Besides, as a-means of normalizing the *h*-index*,* for younger-authors, Hirsch proposed the *m*-value, which adjusts for-time by correcting for the-number of years, since an-author's first-publication. According-to Hirsch, the *m*-value is an 'indicator of the successfulness of a scientist', and the-parameter *m* should-provide a-useful-benchmark, to-compare scientists of different-seniority. The *m*-value can-be-seen as an-indicator for 'scientific-quality', with the-advantage (compared to the *h*-index) that it-is corrected, for-age (Hirsch, 2005).

The *g*-index, developed in-2006 is an-improvement, of the *h*-index. It considers a-drawback of the *h*-index (of *not* taking into-account the-citation-scores, of the-top-articles). The-index is calculated, based on the-distribution of citations, received, by a-given researcher's publications, such, that, given-a-set of articles, ranked in *decreasing*-order, of the-number of citations, that they-received, the *g*-index is the-unique-largest-number, such, that the-top *g* articles received together at-least g^2 citations.

Besides, the *hc*-index adjusts for the-age of the-publication, while weighting authorship-value by author-position, and the-journal-IF (Khan, *et al.,* 2013). The *Carbon_h* factor also-integrates a scientist's research-age into the *h*-index (Carbon, 2011). The *Profit* index *(p*-index*)* estimates contributions of co-authors relative to-the-work, of individual-authors (Aziz & Rozing, 2013). The *Absolute* index *(Ab*-index*)* takes into-account the-impact of research-findings, while weighting the-physical and intellectual- contributions of the-researcher. The-rate of change of the *Ab*-index, per-year, is the-Productivity (*Pr*) index (Biswal, 2013). *The Bh*-index only assesses the *h*-index of articles in *h*-core journals (Bharathi, 2013). Finally, one particularly-interesting-index is the *v*-index, which includes the-proportion of time, devoted to-research, to-normalize, e.g., for clinicalacademicians, who may-devote only 40% to 50% of their-time, to-research (Sheridan, 2005).

Various-alternative-methods, for quantifying author's-scientific-accomplishment have-been also proposed (Hutchins, *et al.,* 2016) including: (1) Citation-normalization, to-journals or journal-categories (Bornmann & Leydesdorff, 2013; Waltman *et al.,* 2011; Zitt & Small, 2008), one of these, is a-previously described-as Relative-Citation-Rate (RCR) (Schubert & Braun, 1986); (2) Citation-percentiles (Bornmann & Marx, 2013); (3) Eigen-vector-normalization, and (4) Source-normalization (Zitt & Small, 2008; Moed, 2007), including both; the-mean-normalized citation-score (MNCS) (Waltman *et al.,* 2011); and source-normalized-impact, per-paper, metrics (Waltman *et al.,* 2013; Bollen *et al.,* 2009). Yet, another-alternative- approach, is to-measure a scholar's impact, based on-number of downloads, from publishers, and analyzing citation-performance, often, at-article-level (Bollen *et al.,* 2006; Brody *et al.,* 2006; Moed, 2005; Kurtz *et al.,* 2004). For more-comprehensive-information on the-different-types of evaluation, refer to: http://libguides.oulu.fi/c.php?g=124852&p=816781Prestige of journals.

Vis-à-vis scientific-social-networks, the ***RG Score*** is a-metric, which measures scientific-reputation, based on how both; one's published-research and contributions, to Research-Gate, are received, by their-peers. A-contribution is anything, one-shares, on Research-Gate, or adds, to-their-profile, from published-papers, and questions and answers, to-negative-results and raw-data-sets. A-special-algorithm looks at how one's peers receive and evaluate contributions, and who these-peers are. This-means that the-higher, the ***RG Scores*** of those who-interact, with one's research, the-more their-own-score will-increase. For more-information, refer to: https://www.researchgate.net/publicprofile.html.

Besides, *RG Reach* is a-way, to-gauge the-visibility of one's work, on Research-Gate. It-shows, how-many **unique-researchers,** can get-notified, when one adds-new-research. The-total-reach is calculated, by-adding the-number of direct-connections, one-has, to-the-number of people connected, to-one's work, through co-authors and project-collaborators. The-higher the-reach, the-more-visible one's work will-be, to-others, on Research-Gate. Having a-higher-reach helps one to-get more-reads and citations, for their-publications.

In-addition, software-applications (free and subscription-based) are available, for authors, to-use for-capture of document-level-metrics, for their-works: Altmetric (http://www.altmetric.com/), Impact Story (http://impactstory.org/), and Plum Analytics (http://www.plumanalytics.com/).

Although some of the-methods, presented, have-radically-enhanced theoretical-understanding, of citation-dynamics (Wang *et al.,* 2013; Stringer *et al.,* 2010; Radicchi *et al.,* 2008; Walker, 2007), *none*, so-far, have-been-*universally*-adopted, as a 'golden-standard'.

1.6. Research purpose

According to *Science in Africa*, Kenya-ranks third, amongst sub-Saharan-nations, in its-output of scientific-papers, published in international-peer-reviewed-journals, following South-Africa and Nigeria. According to Zeleza' study (2005): 'regions and groups with concentrations of economic and political-power tend-to-dominate the production and dissemination of knowledge'. Even in-Africa, South-Africa, Nigeria, and Kenya, are dominant, in scientific-publishing, for the-same-reason.

Kenyan-scientific-publishing, in the-areas of environment, ecology and immunology, even outranks that of economic-heavy-weight Nigeria. On the-other-hand, according to-the-recent African Union' survey, Kenya has scored as last, in-terms of the-increase in-the-numbers of published research-papers (normalized for population-size). Moreover, according to Web of Science ^{SM} for the-period between 2004 and 2008: Kenya is 2nd in Africa, in the-area of Economics & Business, with 54publications (0.07% of global-papers in-the-field); Environment/Ecology- 420 (0.32%); and Immunology - 269 (0.45%). Besides, according to Ogbu (2010), only 0.1% of the-patents, registered in the-United-States-Patent & Trademarks-Office, originate from sub-Saharan-Africa. This-situation clearly pointing-out, at a-microscopic-contribution, to-global-publishing, as-well-as, to-innovation, by sub-Saharan-Africa, including Kenya. Besides, it-also provides an-indication of the-low research-capacity, dissemination of research-findings, and knowledge-production, by the-region.

Moreover, Vijayaragavan *et al.* (2017) in-their-study identified that variables ' influencing research-productivity of scientists belonged to-different-categories, e.g. psycho-social, psychomotor, demographic, organizational, and environmental'. They also-probed 11 major-factors, determining research-productivity of scientists, namely: (1) organizational-research-environment; (2) creativity; (3) perseverance and commitment; (4) research-facility; (5) ability to-work, under-constraint; (6) incentive-policy; (7) proactiveness; (8) purpose-driven-orientation; (9) achievement-motivation; (10) involvement in-teaching; and (11) job-satisfaction. The-authors concluded, that optimum-research-productivity, of scientists, can *only* be-harnessed, when personal and organizational-factors, work in-harmony.

Besides, according to study by Muia & Oringo (2016): 'Constraints on research productivity in Kenyan universities: case study of University of Nairobi, Kenya', research-productivity depends on-the-following independent-variables: (1*) research-culture* (research policy, students' involvement in-research-strategies, budget-guidelines and incentives, and benefits-to faculty-staff); (2) *research environment* (supportive-leadership, clear-goals, and less teaching-load, to faculty-staff); (3) *institutional factors* (level of University, level of supervision, recruitment and selection-policies, disparities among-faculties, training, department-support; and (4) *resource-factors* (expenditure on materials and equipment, better-salary and qualified-staff).

Furthermore, Sulo *et al.* (2012) in-their-study on 'Factors Affecting Research Productivity in Public Universities of Kenya: The Case of Moi University, Eldoret', concluded that the-staff-qualifications, research environment, funding, and time, available to-staff, could-predict, significantly, the-research-output by the-university-staff.

In-addition, according-to Magoha (2006), even in-the-largest-research-university, in-Kenya--the- University of Nairobi (UoN) -- the-efforts, to-enhance-research, and publication-activities, have-been hampered, by lack of adequate-funds, and other-resources. Likewise, more-resent-study by Starovoytova (2017b) pointed-out, that "The-main-finding, with no-fear of exaggeration, is that the-current-state of scientific-research, at the-institution, can-be-perceived as '*a-crisis in-the-making', This-conclusion, is* in accord with the-conclusions of the-Commission for University Education, Kenya. Moreover, the-finding by Waswa *et al.,* (2013) on 45 academic-staff, drawn-from Kenyan-public Universities, in 2011, shown that university-academic-staff are generally-marginalized, when it-comes to-decision-making, even, on-issues, that directly-affect-them. Besides, 'top-down' management-approach is-still-applies and impacts, negatively, on service-delivery.

Such-analyses reflect a-grim-picture of the-barriers to local-research and publication, however, *none* of the-studies, the-author came-across with, provided some-assessment of the *actual*-research-productivity, in-the-local-context, in-particular, among engineering-scholars.

On-the-other-hand, during the-past-few-decades, considerable-attention, has-been dedicated to the-topic of faculty-research-productivity. Such-attention is warranted, since productivity is often used 'as an index of departmental and institutional prestige and is strongly associated with an individual faculty member's reputation, visibility, and advancement in the academic reward structure' (Creamer, 1998). Likewise, more-publications, can lead to-higher rankings, of academic-programs, and entire-institutions (Budd, 2005).While many-studies that have-examined research-productivity, in-Africa have used an-evaluative-approach, with an-emphasis on bibliometrics (see, for-example, Arencibia-Jorge *et al.,* 2012; Boshoff, 2009; Tijssena, 2007 in Mouton, 2008), this-study, like the-HERANA-project, used an-exploratory-approach, to-study faculty-research-performance (see Avital & Collopy, 2001).

Consistent with Massy & Wilger, the-authors of this-paper define productivity, in-terms of individual-faculty-member outputs, while number of publications, in-peer-reviewed scientific-journals, was used as a-proxy, for research-productivity, and it-is also a-main-subject, of this-study. Feldman (1987) found that majority (21 of 29) studies, he reviewed, used the-number of publications, as the-measure of research-productivity.

The-overall-purpose of this-study was to-compare publication-output, among-faculty, in the-School of Engineering, and with the-available-global-data, for research-productivity. Although there-are several-outputs from scientific-research, the-notion that scientific-publications capture the-essence of its-productive-output, is widely-accepted (Inklaar & Timmer, 2009; Bonaccorsi & Daraio, 2003). Journal-articles are the-publications most-readily measured, and thus, most-susceptible, to-evaluation, through any-system, of performance-assessment. According to RIN (2009) journal-articles are the-most-frequent-form of publication, for researchers, in-all-groups of disciplines, and the-bibliometric-analysis indicates, that the-scholarly journal-article-dominance is increasing. Besides, 'Given the increasing emphasis on performance indicators, the measure of the ratio of publications to full-time faculty member can fill an important gap in how institutions [and individual-faculty] are evaluated and compared' (Budd, 2005). Moreover, 'Comparisons over time are best made by examining articles in the population of *influential*-journals' (Javitz *et al.,* 2010). The-journals in this-group, change, over-time, as new-journals may-appear, and attain-influence, while a-few older-journals may-decline or, even, cease to-exist (Javitz *et al.,* 2010).

In-this-study, hence, complete (absolute) counting of peer-reviewed-articles, was conducted, where each-author, which appears in the-author-list, receives one-credit, for an-article, according-to Javitz *et al*. (2010). The-reputation/prestige/standing of journals, where articles were-published, were excluded from consideration, as this-study was largely, preliminary. Moreover, in-this-study, research-productivity was evaluated against: (1) academic-rank; (2) active-publishing-career; (3) age; (4) gender; and (5) field of engineering. The-evaluation was done, on the-basis of lifetime-of active-publishing-career, of a-faculty-member.

In-addition, to-give wide-ranging-view, on the-subject-matter, the-following-relevant-issues were-also addressed: Basic-concepts and measurements of Research-productivity; and Reading-culture.

2. Materials and Methods.

The-study followed the-steps, which shown in-Figure 1.

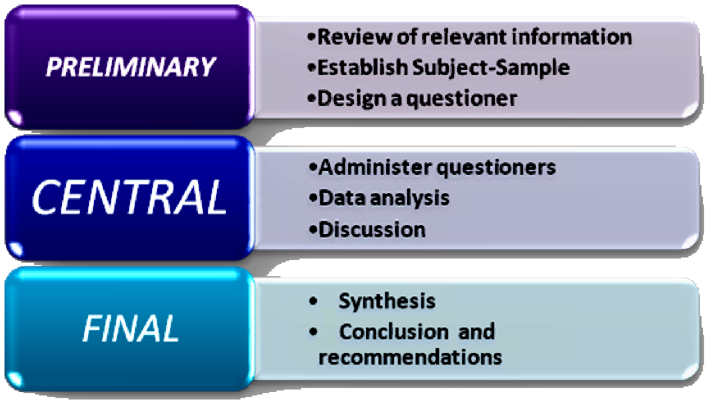

Figure 1: Sequential-parts of the-study (Starovoytova & Namango, 2016a).

Analogous to Starovoytova (2017c), interested-readers could-refer to Starovoytova *et al*. (2015) to-find informative-synopsis regarding Kenya, and its-educational-system. Besides, study by Starovoytova & Cherotich (2016a); provides valuable-particulars, on the-university and the-school of Engineering, where the-study was conducted.

2.2. Sample size and details

To-evaluate the-research-productivity, by the-engineering-faculty, a designed-confidential self-report questioner was used, as the-main-instrument, with the-sample-size of 15-subjects. The-sample was-drawn, from the-five-departments, at the-school of Engineering, such-as: (1) Mechanical & Production (MPE); (2) Electrical &Communication (ECE); (3) Chemical & Process (CPE); (4) Civil & Structural (CSE); and (5) Manufacturing, Industrial & Textile (MIT). Professors, Associate-professors, Senior-lecturers, and Lecturers, form these-departments, were chosen, at-random.

2.3. Main-instruments and measures, used in the-study.

This-study applied a-projective-technique, by requesting questionnaire-respondents questions, about their-research-productivity. Protecting the-rights and welfare, of the-participant, is a-major *ethical obligation* of all the-parties-involved, in a-research-study (Mugenda & Mugenda, 2010). In-this-regard, the-respondents were-guaranteed-confidentiality, and the-questionnaires were filled in-anonymously, with no-identification information. The-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 the-self-report, by the-faculty, on their-scientific-publications and other-relevant-issues.

In-addition, phone-interviews were also-conducted, to-get some-additional-information, *not*-covered, in-the-questionnaire. Moreover, document-analysis was-done, to-bridge the-gaps of information, and to-provide comprehensive-coverage of the-topic.

On-the-other-hand, in-general, productivity-measures can-be categorized into *single-factor* productivity-measures (relating a-measure of output to a-single-measure of input) and *multi-factor* productivity-measures (relating a-measure of output to a-bundle of inputs). Another-distinction is between productivity-measures, which relate gross-output to-one or several-inputs and those, that use a-value-added-concept, to-capture movements of output. The-choice between the-various measures depends on the-focus and the-purpose of the-comparison (Inklaar & Timmer, 2009). In-this-micro-study *single-factor* productivity-measure was used.

2.4. Data Analysis

The-questioner was pre-tested, to-establish its-validity and reliability, according to Hardy & Bryman (2009) and Kothari (2004). Kothari (2005) defines *reliability* as the-consistency of measurement, or degree, to-which an-instrument measures the-same-way, each-time, it-is-used, under the-same-conditions, with the-same-subjects. *Validity* refers to-the-degree, to-which the-instrument truly-measures what it-is-intended, to-measure. In-other words, validity ensures content, construct, and criterion, related validity in the-study (Kothari, 2005). Mugenda & Mugenda (2008), also-advocate that the-pre-test-sample should-be 1% to 10%, depending on-subject-sample-size. Cronbach's alpha-coefficient was calculated, as per Cortina (1993), using the-Statistical-Package for Social Sciences (SPPS-17, version 22)-computer software-program. Descriptive-statistics was utilized, to-analyze both; qualitative and quantitative-data, *via* EasyCalculation-software.

3. Results and analysis.

3.1. Validation of the instrument

The-instrument was-found-adequate; the-length of the-entire-instrument established was suitable and the-material was-logically-organized. It-was considered as acceptable, with some-minor-editing. The responses 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, for perceptions and self-reports, on research-productivity, and established good-inter-item-consistency (Cronbach's a > 0.8), according to-guideline, for interpreting correlation-coefficients by George & Mallery (2003), '>0.9 - Excellent, >0.8 - Good, >0.7 - Acceptable, >0.6 - Questionable, >0.5 - Poor and <0.5 - Unacceptable'.

3.2. Analysis of the-responses to-the-questioner.

Total of 15-questionners were administered, out if which, 11 were submitted-back, giving a-response-rate of 73 %.

3.2.1. Analysis of part1: Demographic-Characteristics

Figure 2 shows the-demographics of respondents.

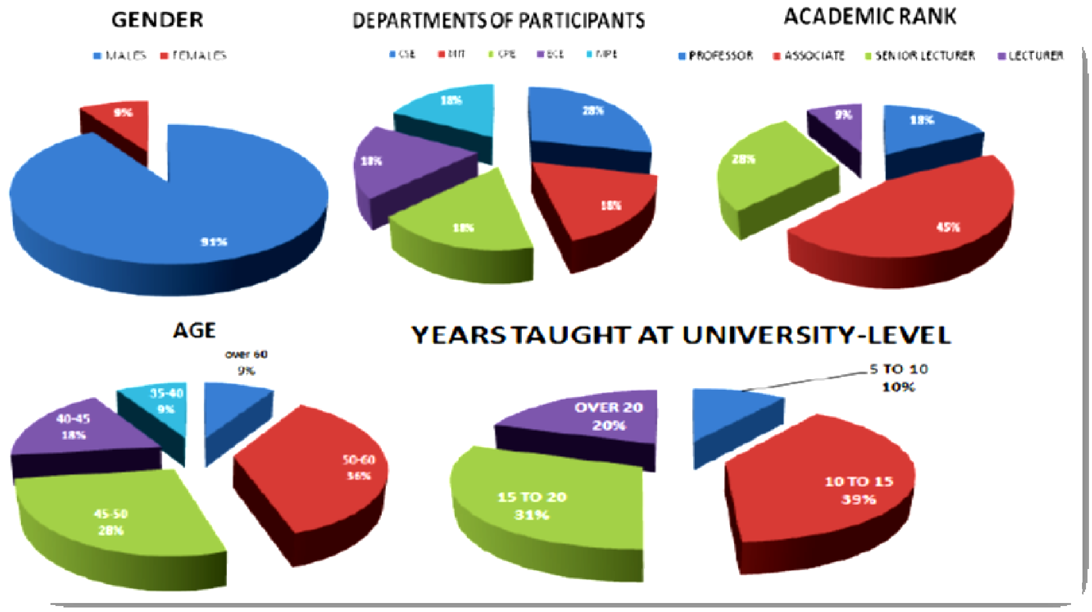

Figure 2: Demographic-characteristics of the-respondents (Starovoytova, 2017a)

Readers could-refer to Starovoytova (2017a) for analysis of gender-imbalance and ageing-faculty, at the-school.

In-this-study, faculty was to-report, the-year, they have-published their-first-paper, and the-last-paper, respectively. One-faculty-member indicated, that they have-published 'many', with *no* provision of exact-number; this-resulted in-the-exclusion, of that-reply, from the-analysis, of the-said-question. Consequently, the-number of respondents to this-question was 10, giving a-corresponding-response-rate of 67%.

To-make an-estimation of the-effort, devoted to-publishing by counting the-number of publications, per year =X/Y, where X is a-faculty member's total-number of publications, and Y is the-number of years of active-scholarship (2017 minus year of the-first-publication). The-average-number of publications, per-faculty, per-year, was obtained at 2.113(with Standard-deviation of 1.36883; Variance (Standard deviation)-1.87369; Population Standard deviation-1.29858; and Variance (Population Standard deviation)-1.68632).

The-following-table, Table 1, presents a-summary, of evaluation of the-number of articles, published, against the-following: (1) Rank; (2) Age; (3) Gender; (4) Teaching-Experience; and (5) Engineering-Discipline.

Table 1: Summary of results: total-number of articles, published.

Rank	Number of faculty	Min	Max	Mean (average)	Standard Deviation	Variance(Standard deviation)
Associate professor	5	22	41	31.5	13.43503	180.5
Senior Lecturer	2	8	10	9	1.41421	2
Lecturer	3	9	23	16	9.89949	98

Age	Number of faculty	Min	Max	Mean (average)	Standard Deviation	Variance(Standard deviation)
30-40	2	16	23	19.5	4.94975	24.5
41-45	2	9	10	9.5	0.70711	0.5
46-50	2	22	35	28.5	9.19239	84.5
51-60	2	33	41	37	5.65685	32
Over 60	2	8	33	20.5	17.67767	312.5

Gender	Number of faculty	Min	Max	Mean (average)	Standard Deviation	Variance(Standard deviation)
Male	9	8	35	21	10.88577	118.5
Female	1	41	41	41	0	0

Teaching Experience	Number of faculty	Min	Max	Mean (average)	Standard Deviation	Variance(Standard deviation)
3-5	1	9	9	9	0	0
6-15	4	10	35	21	10.73934	115.33333
16-24	4	8	41	26	14.30618	204.66667
Over 25	1	33	33	33	0	0

Engineering Discipline	Number of faculty	Min	Max	Mean (average)	Standard Deviation	Variance(Standard deviation)
CSE	1	33	33	33	0	0
ECE	2	10	33	21.5	16.26346	264.5
MPE	2	22	23	22.5	0.70711	0.5
MIT	3	8	41	21.66667	17.21434	296.33333
CPE	2	9	35	22	18.38478	338

4. Discussion.

4.1. Publishing-productivity of the-faculty.

4.1.1. Publications, per-faculty-member.

Getting-published, particularly, in-leading-academic-journals, is perceived as a-reflection of the-quality of the-research-effort, of a-scholar. In-this-study, however, the-assessment of publication-productivity, was limited to *only* quantitative-evaluation (the-number of publications).

It-is well-established, that there-are large-differences, in-productivity, between scientists: a-relatively-small-proportion of scientists, generate the-majority, of the-publications. In 1926, Lotka formulated his-famous *Inverse square law of productivity*, which states, that the-number of authors, producing n papers is approximately $1/n^2$ of those, producing one (Lotka, 1926). This-means that, for-example, of all-authors, in a-given-field, 60 % will-have produced just-one-publication. This-law also implies that, if the-most productive-scientist produces n papers, the-second most-productive produces $n/2^2$, the-third-produces $n/3^2$ and so-on, with a-sharply-decreasing-function (Lotka, 1926). If scientists of different-individual-productivity, are-mixed-together, in an-organization, then the-distribution, of average-productivity, per-organization, should-be less-asymmetric. The-results of several-later-studies have, however, shown, that productivity-differences, in-scientific-publishing, are-less, than indicated by Lotka, and that Lotka's law overestimates, the-number of papers produced, by the-most-prolific-scientists. Nevertheless, according to Kyvik (1991); Price (1986); and Reskin (1977), a-highly-skewed-pattern of productivity, *does* exist, in-scientific-publishing.

Worldwide, it-is-estimated there-are over-50 million-journal-articles, since they-first-appeared, in 1665

(Jinha, 2010). There-are an-estimated 5-6 million-researchers, in-the-world, and every-year 1-million are-unique-repeat-authors (Mabe & Amin, 2002).

Regarding the-number of publications per-researcher, the-information, available at the-time of the-study, is exceedingly-inconsistent. For-example: (1) According to Tenopir & King (2000), the average-productivity of each-author is about one-unique-paper, per-year; (2) On-average, Polish-academic staff-member has one-publication, in a-high-quality international-journal, in four-years (Wolszczak-Derlacz & Parteka, 2010), giving a-research-productivity of 0.25 articles, per-researcher; (3) According to a-large-scale-study by Bonaccorsi & Daraio (2003), based on the-evidence, from the-Italian-National Research-Council, the-average-annual-output, per-researcher was found at 5.75 total-publications, and 3.5 *international*-publications; (4) Journal-articles, per-staff-member, for the-top 20 programs, evaluated during-study, ranged from 2.25 to 7.64 (Shaw & Vaughan, 2008); (5) Top twenty ARL Institutions comparison, of per-faculty-publications, for 2002–2004, the-mean-number of publications is 4.24; the-range is 0.71 to 11.88 (Budd, 2005); (6) In-the-study by Fairweather (2002), he identified, that 11 publications, per-faculty, was produced for 3 year-period, giving an-average of 3.6 publications, per-year, per-capita; (7) Lee & Bozeman (2005) established productivity of American-Scientists to-be-approximately 3.8 articles, per-year; (8) Kenyan-academic-scientists-publish a-mean of 0.5 articles, per-year, according to Duque *et al.* (2005); (9) On-average, the-psychology-faculty in Byrnes' study (2007), authored 11.03 articles, during their-first 7 postdoctoral-years (range 51–33, SD 5 5.87). This-level of productivity translates-to an-average-rate of 1.58 articles per year; and lastly (10) Rorstad & Aksnes (2015), in their-study, concluded, that social-sciences produces, on average, 1.5 articles, per-year; colleagues in the-hard-sciences, produced somewhere between 0.6 and 1.0 articles, per-year, on-average; humanities have overall higher-publication-rate, than research-personnel, in all the-other major-fields; on average, a-researcher within this-field produces 2.02 article equivalents, per-year. From the-presented-data, the-boundaries of research-productivity were identified, as-follows: from min of 0.25 to max of 7.64 publications, per-year, per-faculty-member; giving an-average-number of 2.55 publications (S.D. of 2.10958; Variance (Standard deviation) at 4.45031).

Moreover, there are quite-a-few-record-holders, for-example: (1) Yury Struchkov, Russia published one-paper every 4 days, for 10-years; while 20-researchers, worldwide, each-published at-least-once, every 11days, throughout the-decade of the-1980s (Rennie & Flanagin, 2014). More-resent record-holder is a-nanoscientist, Jan Hendrik Schön, who was widely-regarded as brilliant; publishing, on-average, one-paper every-8days, for more-than two-years, 15 of those, in *Science* and in *Nature* (Anonymous, 2004).

In-this-study, the-analysis revealed, that the-average-number of 2.1 publications/per-year/per-faculty, compares favorably with the-estimations by Wolszczak-Derlacz & Parteka (2010) and Tenopir & King (2000) of one-publication, per-researcher.

In-the-absence of *any*-international, or, national-guidance, or institutional-policy, on how-many-publications, a-faculty-should-produce, every-year, there was *no* benchmark, for-comparison; however, it can-be concluded, that in-this-study, large-statistical-variations were-observed, in-both; the total-number of publications, and the-average-number of publications, per-year, produced by the-subject-faculty-members. Examination of performance, at-individual-level, showed great-variations, e.g., the-most productive-faculty (based on-both; total-number of publications, and average-number of publication, per-year) reported 41 articles, published-during the-4-year-period (2012-2016), giving the-max individual average-number of 10.3 publications, per-year. The-min-number of publications was 8, in-the-period of 9 years (2006-2015), giving the-min individual-average of 0.9 publications, per-year. Therefore, if individual-faculty is evaluated, for 70 % of the-respondents, their-average-number of publications, per-year, exceeds the-said-estimations.

Differences in research-productivity, of an-individual-faculty, may-be-affected by: (1) personal-research-motivation; (2) creativity; (3) scientific-writing-abilities; (4) educational-background; (5) enthusiasm and (6) IQ, among-others. Those-issues were *not* covered, in-this-concise-study, but according to Kungl (2012), they could-be-important, in-some-studies. Besides, previous-studies have-pointed-out, that publication-rate also-depends on a-wide-range of factors, which *cannot* easily be-measured, such-as: (1) the-availability of research-funds; (2) teaching-loads; (3) equipment; (3) availability of research-assistants; (4) workload policies; (5) departmental-culture and working-conditions;(6) organizational-context; (7) talent and hard-work (see e.g., Dundar & Lewis,1998; Ramesh & Singh, 1998); (8) internal-competition, among-faculty; (9) networking and collaborations; a-strong grants-office (the-Research-Support-Center); (10) growing-number of postgraduate-students, and (11) supportive-institutional-management (Fairweather, 2002).

4.1.2. Publications, per-academic rank

As-reported-earlier, Full-Professors, of the-school, did *not* submit their-responses; hence the-following-data shows average-number, of the-total-publications, over the-active-publication-career, of a-faculty, rank-wise, as-follows: Associate-professors--31.5; Senior-Lecturers--9; and Lecturers--16; hence associate-professors were the-most-productive-group, with 31.5 publications, suggesting that academic-seniority does *not* slow-down research-productivity, in the-school.

These-findings are *not* unexpected, as according, for-example, to Aksnes *et al.*(2011); Abramo & Di Costa

(2011); Bordons *et al.,* (2003); Budd (2005); Tien & Blackburn (1996); Kyvik, 1991, the-scientific publication-rate has-been-found to-increase, within the-hierarchy, of academic-positions: professors are the-most-prolific-personnel, while people in-lower-academic-positions tend to-publish fewer-publications, per-year. The-junior-faculty-members are, generally, less-experienced, as-researchers. As knowledge is cumulative, a senior-faculty is more-likely to-have better-abilities to-do-research and write-articles (Tien & Blackburn, 1996; Webber, *nd*). Success in-scientific-careers may-depend, largely, on the-ability, of the-scientists, themselves, but also on some-luck (see the-distinction between *virtu* and *fortuna* by Turner & Chubin, 1979). For-example, a-senior-personnel (say a-professor), may have large-research-group, consisting of several-graduate-students, post-doctors and other-researchers, involved, in-many-research-projects, simultaneously. The-professor will-be involved in the-planning, supervising, and leading, of the-research-projects, but most of the-work, will-be-carried-out, by other-junior-members, of the-groups. The-professor, nevertheless, will get their-name, on *all* publications, produced by the-group.

Besides, nearly-all-theories, of scientific-productivity, hypothesize a-stochastic and cumulative- mechanism (Simon, 1957), or a *Matthew effect* (Merton, 1968), whereby those-faculty, who-gain recognition, in-the-beginning, of-their-careers, receive reward and resources, which will-be-used, to-carry out further-research; meaning that initial-differences, in-individual-productivity will-tend to-be-larger, over time. Besides, Allison and Stewart, found that the *Gini index* for publications and citations of scientists, increases, over-time, in a-series of cohorts, from the-date of the-attainment of PhD, with the-exception of biologists, in their-study (Allison & Stewart, 1974).

The-research-findings are comparable-with, for-example: (1) a large-scale-study by Aksnes *et al.* (2011), which-also-showed that the-professors are by-far, the most-productive-persons. On-average professors published 9.5 publications, during a-four-year period. Next followed associate-professors (4.8 publications), post-doctors (4.5 publications), while the-PhD students had the-lowest-productivity (2.9 publications); and (2) The-median annual publication-rate was 0.7 publications, per-year for assistant professors, 0.9 for associate and 1.3 for full-professors (Shaw & Vaughan, 2008).

Kyvik (1991) examined four-factors, which may-explain the-differences, between academic ranks/position-categories: (1) There are differences, in-abilities, for doing-research; (2) The-higher the-rank, the-more-time used, for research; (3) The-higher the-rank, the-easier it-s to-obtain-funding and assistance, for-research; and (4) Professors have closer-ties to the-informal-communication-network, in-science, than the junior-groups.

4.1.2. Publications, per-age-group

The-following-data shows average-number, of total-publications, over the-active-publication-career, of a-faculty, age-wise, as-follows: The-two-most-productive-age-groups were: (51-60), with 37 and (46-50), with 28.5publications; and the-less-productive was (41-45), with 9.5. It can-be concluded that faculty, between 51 and 60 years-old were the-most-productive, with 37 publications. The-results of this-study are comparable with large-scale-study by Aksnes *et al,* (2011), where the-highest-productivity-number is found for the 50–54 and 55–59 age-groups, and also with Lee & Bozeman (2005), who found, that the-most-productive-age, in all-forms of output, as being 41- 60 years; they also-note that the-earlier and later-years, of one’s career, may *not* be as-productive.

The-problem of ageing, of researchers, has-attracted a-lot of attention, globally, for-example, the-European Commission, initiated a-number of large-scale-research-projects, on the-subject-matter (European Commission, 1997).

There are a-number of poles-apart-findings, on the-impact of age and research-productivity. To-provide an-illustrative-examples: Teodorescu (2000) investigated faculty-publication across 10 countries and discovered, that age, does, significantly-influence research-productivity. On-the-other-hand, in a-study of 228 colleges and universities in-the U.S.A., Kotrlik *et al.* (2002) found, that age does *not* affect research-productivity.

Moreover, Merton suggested that age, is a-component, of the-stratification-system, of science: with-age, scientists escalate the-hierarchy, of the-scientific-community, and increase their-productivity, impact, and rewards. In other-words, the-scientific-community could-be seen as a-gerontocracy. Likewise, more-recently, Wray (2003) found that, it was *not* young-scientists, but middle-aged-scientists, who were responsible, for-disproportionate-number, of significant-discoveries.

The-relationship, between-age, and publication-rate, has-been found, to-be-curvilinear, in-several studies. The-average-production of publications, increases with-age, and reaches a-peak, at-some-point, during the-career, and then, declines (see Aksnes *et al.,* 2011; Gonzalez-Brambila & Veloso, 2007; Barjak, 2006; Bozeman, 2005; Kyvik, 1990; Cole, 1979). This life-cycle aging-effect was found by Levin and Stephan, for most-scientific-areas (see Levin & Stephan, 1991).

An-important-cause of age-related productivity-declines is likely to-be reductions in-cognitive-abilities, across the-life-span. Resent-study, by Starovoytova (2017b), cited Nyberg *et al.,* (2012), pointing-out, that the-working-memory (short-term-memory) and episodic memory-performance remain relatively-stable, until 60-65years of age. Episodic-memory is a-long term-memory, which relates to-personal-experience (Umanath &

Marsh, 2014). Although, in-general, performance on-episodic and working-memory, decline with the-advancement of age, it-depends on inter-individual-variability. Some-individuals start declining, as-early-as, in-their 50s, while-others preserve-well into-their 70s and 80s (Nyberg *et al,* 2012).

Besides, some-abilities, such-as: perceptual-speed, show relatively-large-decrements, from-a young-age, while others, like verbal-abilities, show only small-changes, throughout, the-working-life. Although older-individuals have longer-experience, they learn at a-slower-pace, and have-reductions, in their-memory, and reasoning-abilities. In-particular, senior-faculty, is-likely to-have-difficulties, in adjusting to new-ways of working, and thinking (Skirbekk, 2003). Further-evidence on that older-researchers have decreased research-output is found in Bratsberg *et al.* (2003) and Bayer (1977). On-the-other-hand, Kyvik (1990) also-noted, that the-researchers, with-more-recognition, keep-publishing-frequently, after their-less-recognized-colleagues, reached their-peak.

Another-issue involves the-relationship, between-age and the-quality, significance and impact, of the-research. A traditional-assumption has-been, that science is a 'young man's game' where the-best-work is done at a comparatively-young-age (Merton & Zuckerman, 1973). Already, in 1953, Lehman in a-classical-study found, that the-most-important-discoveries tended to-be-made by younger, rather than older-scientists (see Lehman, 1953). Lehman also-concluded, that the-majority of scientists, is most-creative, when they-are in their-late thirties or early-forties. According to Cole (1979), however, the-study of Lehman, has-been-shown to-be flawed, methodologically. On-the-other-hand, more-recent-research still-shows, that young-researchers (measured-by either; chronological or professional-age) are more-productive and creative, than older-ones, as they-have a-fresh-look, at-scientific-problems.

4.1.3. Publications, per-gender

The-following-data shows average-number, of total-publications, over the-active-publication-career, of a-faculty, gender-wise, as-follows: females-41; males-21. Females were most-productive, with 41 publications. This-finding of the-study is comparable with a-recent-study on Dutch-social-scientists, Van Arensbergen *et al.,* (2012), who found that female-researchers outperformed male-researchers, in-terms of number of publications, and to-a-lesser-extent, a-conclusion of Muriithi's study of 2013, that '…differences across institutions, age and gender-categories were non-significant'.

Many-other-studies, however, had opposite-findings, generally, revealing, that women-publish-less, than men (Aksnes *et al.,* 2011; Sax, 2002; Bellas & Toutkoushian, 1999; Sax *et al.,* 1999; Xie & Shauman, 1998; Creamer, 1998; Kyvik & Teigen, 1996; Long, 1992; Hamovitch & Morgenstern, 1977; Astin, 1969), although there has-been some-convergence of the-gender-gap, over-time (Ward & Grant, 1996). For-example, Aksnes *et al.,* found that for almost-all age-groups and domains, men are more-prolific, than women. Female-scientists tend to-publish, generally, between 20-40% fewer-publications, than their-male-colleagues. Larivière *et al.* (2011) also-conclude that women tend-to-publish between 70 and 80 %, as-many-publications, as-men. In-addition, according to Rorstad & Aksnes (2015), overall, men have higher-publication-rate, than women, up to the-age of 55–59 years; and in-their-study, men produced 0.63 articles, per-year, while females produce 0.47 articles (Rorstad & Aksnes, 2015).

In-an-attempt to understand these-differences, many-researchers have focused on family-related variables (Creamer, 1995, 1998; Hamovitch & Morgenstern, 1977) such-as: being-married (Astin & Davis, 1985; Astin, 1969; Hamovitch & Morgenstern, 1977; 1978), the-number of children, in the-household (Astin, 1978; Hamovitch & Morgenstern, 1977), and having a-spouse, who is an-academic (Creamer, 1995). Family-related factors have-been-used, as the-object of inquiry, in previous-studies, primarily-due-to the-potential-time-conflicts, that-arise, between family and career-responsibilities. On-the-other-hand, Sax (2002), suggests that a-career 'interruption' (due to-childbirth, and associated-child-care-responsibilities), may-actually-enhance research-productivity, for some-faculty.

It was also-found, that usually, the-proportion of female-researchers decreases, within the-hierarchy of positions. Particularly among-professors, there are few-females, while there is more-gender-balance, among PhD students (see e.g., European Commission, 2012). One-possible-explanation for the-gender-difference, is that women-occupy fewer of the-highest-academic-posts, and also are-less-integrated, in the-scientific community, for-example, by positions/membership in-scientific-associations, and on the-editorial-boards of journals (Puuska, 2010; Prpic, 2002; Xie & Shauman, 1998; Bentley & Blackburn, 1992). Nevertheless, studies have also-shown, that differences in-publication-rate, among men and women, can-be found at-all-levels, of academic-positions (Aksnes *et al.,* 2011; Kyvik, 1991).

Yet another-explanation of the-gender-differences, it has been-suggested, that women and men, choose differently (Ward & Grant, 1996). While women devote-more-time, to-teaching (including: part-time, and teaching in-fields, outside their-specialization) and administrative-work (Collins, 1998), male-scientists focus-more, on-research and supervision, of PhD-students. These-distinctions, often-viewed as inequities; moreover female-faculty faces substantial-challenges, in their-pursuit of jobs, tenure, and promotion. Further, these-multiple-challenges also-serve, to-detract, from women's overall satisfaction, with their chosen-academic-career

(Hagedorn & Sax, 1999).

Examining, the-issue of gender, much-deeper--at the-root of the-problem, one should-look-back, into-perceptions of high-school-girls, on-engineering, as a-profession (when they are choosing their-future-career), and resulting from it, female-underrepresentation, at Engineering-schools; Challenges, faced by female-engineering university-students, which in-turn, results in gender-imbalance in-engineering-profession, and in-academia, as-well; largely, it is a-global-trend. For-example, at a-local-context, the-study by Starovoytova & Namango (2016b) identified an-interesting-phenomenon, which could-be one of the-major contributing-factors, to-female-underrepresentation, in-Engineering-education. This-phenomenon happens, when redundant-stereotypical-perception, about Engineering, and very-persistent out-dated Gender-stereotype, meet 'head-to-head', when female-candidates choosing, their-future-career. Further, the-authors also reported that: 'Engineering female-parity-index was-found to be 0.0038, meaning that on average for 260 female-students, admitted to the-university, only 1(one) female-student was admitted to SOE. The-situation, in Engineering-school, is more-distinct as the-admission ratio of F/M is 0.143, meaning that for every 7 male-students, admitted to SOE, there-was only-one female-student. Logically, in-order-to-attract, much-more-females, into-engineering, both-stereotypes (Engineering and Gender) should-be challenged and, in the-long-run, changed (Starovoytova & Cherotich, 2016 b). In-addition, another-study by Starovoytova & Cherotich (2016c) identified, that: 'it is apparent, that the-female-students, indeed, faced numerous-gender-related-challenges, and, even, harassment, from teachers and classmates, in studying, at the-School of Engineering'.

SOE, not-surprisingly, is male-dominated, with female-staff contributing *only* around 16%; moreover, majority of which is in-junior-positions, such-as: Graduate-assistants and Tutorial-fellows. In-this-study, a-selected-female (an-associate-professor) was the-most-productive, in-both; total-number of publications, and the-average-number of papers, published, per-year. This implies, that family-related-factors do *not* interfere, with scholarly-productivity, for some-female-faculty. This-finding is in-accord-with conclusion of Sax (2002). On-the-other-hand, single-faculty do *not* paint an-entire-picture, of the-population, from which the 'cream of the-crop' stand-out, and what might-be-referred-to, as the-long-tail of lesser-achievers. The-study, hence, recommends, that further-investigations should-be carried-out, to get more-inclusive-gender-representation and, hence, obtain more-conclusive-data.

4.1.4. Research/Publications and teaching-experience

Faculty-members, with the-teaching-experience of over 25 years, were the-most-productive, with 33 publications, followed by faculty-group, having teaching-experience of 16-24 years, with 26 publications.

Prince *et al.* (2007), pointed-out, that the-research *vs.* teaching debate has-been-raging, for a-long-time, and there is much to-justify. On-the-other-hand, Weimer's (1997), characterized the-debate as: 'old, tired, boring, and…*not* productive'. A large-part of the-problem is that those, who-claim research supports teaching, generally-argue that synergies, between research and teaching, can-occur, in-principle, while their-opponents, contest that synergies occur, in-practice.

Currently, three-different-positions do exist, on the-relationship between teaching and research, as-follows:

(1) Astin (1994) found a-significant-negative-correlation, between a-university's research-orientation and a-number of educational-outcomes. He-concluded, that:

Attending a-college whose faculty is heavily research-oriented increases student dissatisfaction and impacts negatively on most measures of cognitive and affective development. Attending a college that is strongly oriented toward student development shows the opposite pattern of effects.

Besides, Bates & Frohlich (2001) pointed-out on a-number of researchers-view, that faculty-research and teaching-roles, as-being in-conflict (Friedrich & Michalak, 1983; Veysey, 1965). Blackburn (1974) noted, for-example, that unsatisfactory-classroom-performance might-result-from academics, neglecting their-teaching responsibilities, in-order-to-pursue research and publications.

The-time and energy, required to-pursue-research is limited, by the-time-demands of teaching, and *vice-versa* (Marsh, 1987). Marsh also-suggested, that the-motivation, and reward-structures, that support the-two-activities, might-be antagonistic, as-well. Moreover, Felder (1994) and Rugarcia (1991) stated that, research and teaching, have different-goals and require different-kills and personal-attributes. The-primary goal of research, is to-advance-knowledge, while that of teaching, is to-develop and enhance-abilities.

Barnett (1992) claimed, that teaching and research, are obviously-incompatible. He-argued, that universities have-already-begun, the-process of dividing the-university-structure, into-components, devoted to-undergraduate-education, taught by non-tenure-track-teachers, and graduate-students, and to full-time research (in-this-case teaching becomes secondary).

Besides, Hattie & Marsh (2004), point-out, that time, on-research, is related to-research-productivity, but *not* teaching-effectiveness, whereas-time, on-teaching, is *not* related to-teaching-effectiveness and slightly-negatively-related to-research-productivity.

(2) On-the-other-hand, a-number of authors view research-productivity, as adding to the-quality and substance, of the-classroom-experience (Demski & Zimmerman, 2000; Braxton, 1996; Allen, 1995; Allen, 1996,

Tanner *et al.,* 1992; Ramsden & Moses, 1992). Senior-academics often-contend, that this-symbiotic-relation, between teaching and research, is what distinguished universities, from other-research and educational-institutions (Neumann, 1992). Conventional-wisdom, typically *not* based, on empirical-research, is that teaching and research, are mutually-supporting, if *not* inseparable (Webster, 1986).

Besides, according to Marsh & Hattie (2002), teachers, who-are involved, in-research, are more-likely to-be at the-forefront, of their-discipline. In-addition, students appreciate teachers, who-present-research that the-teachers have *actually* conducted. This-provides an-authenticity, to the-presented-material, that differs from presentations, by-teachers, who are only-discussing, the-work of others, in-which they have *no* active-involvement.

In-explaining why, teaching and research, should-be complementary-activities, Braxton (1996) argued, that the-roles of teaching and research are-similar, that they-involve common-values (e.g., rationality) and that they-should-be equally-supportive. Sullivan (1996) emphasized, that, even, the-most-productive researchers, support normative-structures, which place a-high-value, on teaching-effectiveness. Marsh (1987) also-posited, that the-ability to-be an-effective-teacher and a-productive-researcher are positively-related.

(3) Still, there-are studies, that do *not* find any-relationship, between teaching and research (Melland, 1996; Bates *et al.,* 1996; Baker *et al.,* 1998). Regardless of the-methodology, used in the-studies, most-studies indicate that, at-best, teaching and research, are only slightly-correlated-variables. For example, Hattie & Marsh (1996) examined 58 studies and explored correlations between such-measures of teaching as-student-evaluations, peer-evaluations, and self-evaluations, and a-number of measures of research-productivity, including numbers of papers, citations, and grants. Their-conclusion was that for teaching and research 'the-relationship is zero'. In a-subsequent-analysis (Marsh & Hattie, 2002), the-same-authors sought specific-conditions, under-which, research supported teaching, *but* their-analyses failed to-reveal a-single-moderator, to the-general-findings, leading-them, to-conclusion, that the-observed-absence of correlation, between teaching and research, is-strong.

Moreover, Feldman (1987), examined 42 studies, and concluded that: 'the likelihood that research productivity actually benefits teaching, is extremely small…the two, for all practical purposes, are essentially unrelated'. Likewise, Jenkins (2004) reviewed the-literature, through 2004, and also-failed to-find convincing-evidence, that involvement, in-research improves teaching, and *vice versa*.

The-three-main-functions of a-university are: teaching, research and service (outreach). The-functions are completely-independent; in-most-universities, *only* teaching is compulsory. Majority of universities, however, give the-most-emphasis to-research, especially, in the-faculty evaluation-process, for-promotion. As they say 'it is a-bad-soldier, who does *not* dream to-become a-General', in-the-same-spirit, almost-every faculty's desire is professional-advancement, hence they have-to-do-research. In-the-author' opinion, teaching and research is mutually-reinforcing, subject to-time and effort-balancing, of these-two-functions.

4.1.5. Publication per-Engineering-disciples

CSE was the-most-productive with 33 publications, the-rest of the-departments produced within the-range of 21.5-22.5 publications.

Previous-studies, point-out to significant-differences, in knowledge-production-processes, across-disciplines and specialist-areas (Fry, 2003; Becher & Trowler, 2001; Whitley, 2000).

In-addition, according to Starovoytova & Namango (2016b): 'Most engineers specialize. Engineering encompasses a vast diversity of areas of specialization (over 36 major branches and more than 200 sub-fields and areas of expertise)'.

Regardless of the-engineering-discipline, the-fundamental-role of engineers is to-solve societal-problems and to-make life, better, for-all. For-example, Seliger *et al.* (eds.)(2011) indicated, that the-National-Academy of Engineering has-announced, on 15 February 2008, the-following 'Engineering Grand Challenges': (1) Make solar-energy economical; (2) Provide energy, from fusion; (3) Develop carbon-sequestration-methods; (4) Manage the-nitrogen-cycle; (5) Provide access to-clean-water; (6) Engineer better-medicines; (7) Advance health-informatics; (8) Secure cyberspace; (9) Prevent nuclear-terror; (10) Restore and improve urban-infrastructure; (11) Enhance virtual-reality; (12) Advance personalized-learning; and (13) Engineer the-tools, of scientific-discovery.

In-addition, in 2015, countries adopted the 2030 Global-Agenda, for Sustainable-Development, and its 17 very-ambitious Sustainable-Development-Goals, namely: (1) End poverty, in all-its-forms, everywhere; (2) End hunger, achieve food-security, and improved-nutrition, and promote sustainable agriculture; (3) Ensure healthy-lives and promote well-being, for-all, at-all-ages; (4) Ensure inclusive and equitable-quality-education, and promote lifelong-learning- opportunities, for-all; (5) Achieve gender-equality and empower all-women and girls; (6) Ensure availability and sustainable-management of water and sanitation, for-all; (7) Ensure access to-affordable, reliable, sustainable and modern-energy, for-all; (8) Promote sustained, inclusive and sustainable-economic growth, full and productive- employment and decent-work, for-all; (9) Build resilient-infrastructure, promote inclusive and sustainable- industrialization, and foster innovation; (10) Reduce inequality, within and among-countries; (11) Make cities and human-settlements inclusive, safe, resilient and sustainable; (12) Ensure sustainable-consumption and production patterns; (13) Take urgent-action, to-combat climate-change and its-impacts; (14) Conserve and sustainably-use the oceans, seas and marine-resources, for sustainable-development; (15) Protect, restore and promote sustainable-use of terrestrial-ecosystems, sustainably-manage forests, combat desertification, and halt and reverse land-degradation, and halt biodiversity-loss; (16) Promote peaceful and inclusive-societies, for sustainable-development, provide access to-justice, for-all and build effective, accountable and inclusive-institutions, at all-levels; and (17) Strengthen the-means of implementation, and revitalize the Global Partnership, for Sustainable-Development (UN, 2016).

Engineering-faculty should use these-challenges and goals, as-a-focus, in-their-research, to-make life-better, for-all.

As a-final-point, the-number of publications, per-faculty-member, gives much-more clearer-reflection, of personal-publishing-tempo, regardless of the-academic-rank, teaching-experience, gender, and engineering-discipline. The-study, hence, suggests, that there is, probably, a-lack of mentorship and facilitation, from the-most-published-faculty towards the-junior-ones (see Starovoytova, 2017b). In-this-regard, engineering-faculty should-be encouraged to greater-collaboration, across-disciplines and professions (see Starovoytova, 2017b), produce ethical-research (see Starovoytova, 2017a), and avoid plagiarism (see Starovoytova, 2017e; Starovoytova & Namango, 2017; and Starovoytova & Namango, 2016c), among other-possible-activities.

Phone-interviews were also-conducted, to-get some-additional-information, *not*-covered, in-the-questionnaire.

4.2. Reading and reading-culture

During phone-interviews, on-the-question: '*Do you usually read, daily*?', only 73% answered affirmative, moreover, on the-genre of literature, that they usually-read, most of the-faculty-sample (82%), reported reading *only* technical-literature, and mainly, for literature-review, when they are writing, a-new-manuscript. They also spend varied-amount of time, on-literature-review, ranging from 40-500 hours/paper. In-addition, they confessed, rarely-reading, the-entire-article; instead they just 'scanning' it, to-quickly-choose *only* the-relevant, to-their-inquiry, information. These-findings pointing-out, that the-faculty's reading-habits was out of balance; in-addition, majority of the-respondents, read very-little, and *not* on a-daily-basis, meaning that reading is *not* their-habit, or culture. The-findings also in accord with Ware & Mabe (2015), who stated, that researchers reading-more, averaging 270-articles-per year, but spending less-time per-article, with reported reading-times down from 45-50 minutes, in the mid-1990s, to just over-30 minutes, in 2014.

Previous-researchers reported, that the-poor-reading-habit has-been-attributed to-factors, such-as: (1) the-colonial-education-system; (2) limited-access, to-reading-materials; (3) dominant-effect, of the-mother-tongue (Ruterana, 2012a); (4) poor-government-policies (Aliyu & Bilkisu, 2012; Otike, 2011); (5) poor-parental-training and nurturing-reading; (6) limited-disposable-income; (7) reluctance by teachers to-cultivate it; and (8) the-rooted-use, of oral-communication, in-African-culture (Kaberia 2012; Doiron & Asselin 2010; Nalusiba 2010). In-Kenyan-context, in-particular, contributing-factors are: (1) Poverty-levels and hardship (2) Current Kenyan-academic-curriculum (3) Preoccupation with money, that has eroded the-interest, for-the-search of knowledge (4) Being too-lazy and un-interested, to-read; (5) Lack of well-organized and adequately-stocked-libraries, and (6) Poor-publishing-industry, among-others (Kaberia, 2012; Nalusiba, 2010).

Reading is a-rather-complex, mentally-stimulating, interactive-process, of simultaneously--thinking, reasoning, predicting, questioning, evaluating, interpreting, cognitive-visualization, and comprehension, from printed or hand-written-words, phrases, sentences, and from visual or pictorial-illustration. Academicians read to-learn; to-synthesize and to-integrate-information; to-evaluate; to-critic, and for-general-comprehension, among-other-reasons. Throughout-reading, all-types of thinking are utilized, such-as: analytical, critical, evaluative, imaginative, judgmental, creative, and problem-solving, among-others.

One's reading-habit is developed over-time; it-goes beyond, the-ability, to-just read and write, to a-point, when it-evolves, into a-habit and, ultimately, into a-culture. Junuis (2009) defines reading-culture as: 'Learned-practice of seeking knowledge, information, or entertainment, through the-written-word'. He also argues that 'Reading-culture-process involves the-perception of words and comprehension of text, and reaction, to-what is read, and even the-fusion between the-old and new-ideas'. According to Jonsson & Olsson (2008): 'a-reading-culture means, that reading, is a-part of a-specific-culture and a-habit, which is shared and valued, highly, by that-particular-society".

The-African-culture, for-example, is 'an-oral-society', where people-do more-chatting, than reading (Nalusiba, 2010). It-is-also believed, that Africans developed, a-highly-effective-oral-tradition and over-reliance, on the-spoken-word; therefore they, usually, commit all-important-matters, to-memory. Even though, the-oral-culture of Africans allows for interaction, within-their-society, reading and writing, is a-global and dominant-culture, that must-be-encouraged and fully-adopted, for proper-understanding, and overall-productive-relations, with other-cultures (Jönsson & Olsson, 2008).

Research on-reading-culture, in-the-African-context, has-been-conducted, in-recent-times, by-many-researchers, such-as: Owusu-Acheaw (2014); Ruterana (2012a, 2012b); Aliyu & Bilkisu (2012); Kaberia (2012); Otike (2011); Doiron & Asselin (2010); Nalusiba (2010); Ogwu (2010); Ifedili (2009); and Jönsson & Olsson (2008). Research showed, that black-people, including Kenyans, have, rhetorically, been known, to-have a-very-poor-reading-culture, where information is conveyed, through-narrations, and demonstrations, because it-is a-chatting-society (Nalusiba, 2010). Lewis Michaux (a black-American activist and a-book-seller, who lived in-between 1884 and 1976) once said "the-best-way to-hide-something, from a-black-man, is to-put it in-a-book". Audio and video-formats, hence, may interest-people, more, because they-are-closer, to what the-African-society, is accustomed-to, than the-text-format.

According to SoftKenya.com: 'Kenya would be a-great-country, if citizens read, as-much, as they discuss politics or the-English Premier League'. Kenyan-culture, in-particular, encourages people, to-spend leisure-time, in sporting-activities, recreational-places (bars, clubs, and hotels), churches and mosques. Younger-generation, on-the-other-hand, spends most of their-time on-social-media, playing video-games, watching-movies (mostly recorded via Internet); following celebrity-gossip, discussing European-football, and on-other-social-activities, such-as drinking. Besides, Abrams (2016), pointed-out, that the-Kenya Publishers-Association declared that the-state of the-culture of reading, in-Kenya was-troubling, and was-affecting 'the-language-development of children'. Kenya-Publishers-Association chairman, David Waweru, said: "The problem with the Kenyan society is that we read mostly for exams, light academic fires and burn books as we dance after 'completing education", and "The result is that we can barely communicate well in either English or Kiswahili, and most of our children cannot spell words correctly." Moreover Prof. Mberia saying that a-healthy-culture of reading needs-to-start, right at-the-beginning, in the-schools; "We have killed the reading right from schools. If you are found reading a book that is *not* examinable, teachers condemn the student, instead of encouraging them."

4.3. Importance of reading

The-global-reading-culture has-been almost-destroyed, by the-never-ending-explosion of home-videos, e-books (in any-genre); video-games; social-media; the-absence of good-libraries, right from the-secondary school-level and a national-trend, towards giving a-higher-priority to money-making, than rigorous scholarship (Henry& Neville, 2004).

Bradford (2012) found-out that, technology has-rewired the-brain-infrastructure and, thus, impacted our-reading-habits, specifically looking at deep-reading or intensive-reading. *Intensive-reading* is an-activity, involving reading, for-details, according to the-author: 'The-aim of intensive-reading is to-arrive at profound-details', understanding a-text *not* only what-it-means, but-also of how meaning is created; it-means very-detailed-reading, to-attest-everything, in-the-text.

For-academicians, in-addition to-intensive-reading, other-strategies of reading are also-important, such-as: *Scanning,* which requires a-quick-glance, through a-text; it-is to-read-quickly, in-order to-look for specific-information, rather than reading the-whole-text. Another-strategy is *skimming*; according to Williams: 'Skimming means peeking-rapidly through a-text' by merely dipping-into-it, and sampling it at-various-points, in-order, to-comprehend its-general-content; he also emphasizes that the-purpose of skimming is to-briefly-summarize, what the-text is all-about.

Information is power, and a-key-enabler, for personal and societal-development (Ruterana, 2012a; Ogwu, 2010; Nalusiba, 2010; Ifedili, 2009). To-get-information, however, as a-mere-minimum, one, must-know how-to-read. A-survey, by the-Kenya-National-Adult-Literacy, conducted in-2006, revealed that there-were over 7.8 million (38.5%) illiterate-adults and youth, in-Kenya. There-are-also very-wide regional-disparities; for-example, Nairobi had the-highest-level of literacy, of 87.1%, compared to North-Eastern-Province, the-lowest, at 8.0%. UNESCO (2015) had-set a-target to-attain 50% literacy for all-countries; but as things are now, Kenya, is yet-to-achieve, the-target.

Reading is a-key to-success, in any-academic-pursuit and, indeed, in-life. The-benefits of reading, according to Brad (2007) include: (1) mental-stimulation, as it keeps the-brain active and engaged; (2) builds self-esteem and determination; (3) it spreads wisdom and knowledge; (4) it provides mental and physical-relaxation; (5) it acts, as a-communication-tool; (6) reading keeps one up-to-date; and (7) reading transports the-reader, to another-realm. Moreover, it has-been-established, to-improve 'fluency, comprehension, vocabulary, cognitive-development, verbal-skills, content-knowledge', among-others. Besides, as Okebukola (2004) states that reading provides the-tools, for transmitting-ideas, to-succeeding generations, as-well-as the-opportunity of partaking, of the-wisdom, of past-generations.

Moreover, according to Denchant'-statement (1993): 'If the-first-button of a-man's-coat is wrongly-buttoned all-the-rest are certain to-be-crooked. Reading is the-garment of education'. A-huge group, of ignorant-population, can-pose a-serious-problem, in a-country, as it-is commonly-said 'little-knowledge is dangerous'. Therefore, reading-culture should-be-encouraged, advocated and supported, at all-levels, of human-development, starting from nursery-school and maintained thought-out the-life-time of a-person, for continuous self-improvement.

On the-other-hand, academicians *must* read constantly, broadly, as-well-as selectively, and also they must read a-lot, to-be-relevant and up-to-date, with the-new-developments, *not* only in-their own-fields, but also on any-other-major global-developments. This-implies that failure to-generate or tap into-information leads to a-slowing-down of growth and development, *not* only of a-person, but of the-whole-country, at-large.

In-addition, Ifedili (2009), also-emphasizes the-significance of good-reading-culture, which includes improvement of individual's welfare, social-progress, and international-understanding. The- importance of reading is placed on its-ability, to-foster personal and national-growth (Ogwu 2010, Ribeiro as cited in Nalusiba, 2010). Therefore, it-is-important to-encourage a-reading-habit, so that people grow-up mentally, to-be-able, to fulfill their-potentials, to-achieve personal-and societal-growth, at every-level of social status, from a-villager to a-university-professor.

5. Conclusion and Recommendations.

5.1. Conclusion

Understandably, this-micro-scale *unfunded* study is of introductory-nature; nevertheless, author strived, to-give a-foretaste of the-current research-productivity-situation, at-the-school, which can serve as a-point of reference, for future-studies. Moreover, an-interconnected-issues were-also incorporated, to-bring deeper-grasp, on-the subject-matter.

The-author believes this-study will-make a-contribution (in its-small-way) to-the-body of knowledge, on research-productivity.

5.2. Recommendations

Some-academicians and, even, publishers, criticize the-evaluation of a-quality of a-publication *via* quantitative-reflection. San Francisco Declaration on Research Assessment (DORA) provides a-set of recommendations regarding assessment, of individuals and institutions, without emphasizing the-IF http://am.ascb.org/dora/. DORA general-recommendation suggests that, while evaluating research-performance, focus should-be-given, on scientific-content, rather than publication-metrics. In-this-spirit, the-university should-also modify, their-exclusive-emphasis on-the-number, of publications, and shift to-qualitative-evaluation, which shows *real*-intellectual-contribution of the-author(s), to-their-field.

The-study focused on-an-absolute-number of publications, produced by an-individual-faculty; the-total account of 230 publications, however, could-be overestimations, as some-faculty co-authored some of their-papers with their-colleagues, from the-school or from outside, resulting in-repeated-counts. The-study, hence, recommends to-conduct a more-comprehensive-study, taking into-account co-authorship in-each of the-publications (so-called 'fractional-counting').

Moreover, number of publications, is just one-measure, of research-productivity, of a-faculty; the-quantity of publications, on-its-own, reflects nothing, about their-quality, therefore, other-issues, such-as: workload, citations, and impact-factor of the-journals, where papers were-published, should-be considered, in-future-studies.

In-addition, other-forms of publications, such-as: books, monograms, conference-presentations, and patents, among-others, should-be-included, in-future large-scale-studies, on research-productivity.

Finally, the-study, also-recommends, that further-investigations should-be carried-out, to-get more-inclusive-gender-representation and, hence, obtain more-conclusive-data.

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References

Abbott, M. and Doucouliagos, H. (2004). "Research output of Australian universities", *Education Economics Journal,* 12(3).

Abramo, G.; D'Angelo, C. and Di Costa, F. (2011). "Research productivity: Are higher academic ranks more productive than lower ones?" *Scientometrics*, 88(3).

Abrams, D. (2016). Kenya Publishers Association Cites Concern for Reading Culture. In News, September 27, 2016.

Allen, M. (1996). "Research Productivity and Positive Teaching Evaluations: Examining the Relationship Using Meta-Analysis", *Journal of the Association for Communication Administration*, May, (2).

Allen, M. (1995). Research Productivity and Positive Teaching Evaluations: Examining the Relationship Using Meta-Analysis, Proceedings, Annual Meeting of the Western States Communication Association, Portland, OR, February 10-14.

Aliyu, A. and Bilkisu, M. (2012). "Promoting reading culture in our society". Paper presented at the Reading

Culture Promotion Program of the National Library of Nigeria, May 27.
Allison, P. and Long, S. (1990). "Departmental effects on scientific productivity", *American Sociological Review*, *55*(4).
Allison, P. and Stewart, J. (1974). "Productivity differences among scientists: evidence for accumulative Advantage", *American Sociological Review*, 39 (4).
Arencibia- Jorge, R.; *et al.* (2012) *Scientific Development in African Countries: A scientometric approach 1996–2009.* Project report. Editorial Universitaria, Ministerio de Educación Superior.
Anonymous (2007). Author Guidelines. Double-Blind Peer Review Guidelines. [Online] Available: https://www.journals.elsevier.com/social-science-and-medicine/policies/double-blind-peer-review-guidelines/(11 February, 2017).
Aksnes, D.; Rorstad, K.; Piro, F. and Sivertsen, G. (2011). *Age and scientific performance. A large-scale study of Norwegian scientists*. Paper presented at the ISSI 2011, Durban, South Africa.
Astin, A. (1994). *What Matters in College? Four Critical Years Revisited*, San Francisco, CA: Jossey-Bass Inc.
Astin, H. (1969). *The Woman Doctorate in America*. New York: Russell Sage Foundation.
Astin, H. and Davis, D. (1985). Research productivity across the life and career cycles: facilitator and barriers for women. Reprinted in J. S. Glazer, E. M. Bensimon, and B. K. Townsend (eds.), *Women in Higher Education: A Feminist Perspective*, pp. 415–423. Needham Heights, MA: ASHE Reader Series, Ginn Press.
Avital, M. and Collopy, F. (2001). "Assessing research performance: Implications for selection and motivation", *Sprouts:Working Papers on Information Systems,* 1(14).
Aziz, N. and Rozing, M. (2013). "Profit (p)-index: the degree to which authors profit from co-authors", *PloS One*; 8.
Baird, L. (1991). "Publication productivity in doctoral research departments: Interdisciplinary and Intra-disciplinary factors", *Research in Higher Education*, 32(3).
Bassey, U.; Akuegwu, B.; Udida, L.; and Udey, F. (2007). "Academic staff research productivity: A study of universities in South-South Zone of Nigeria", *Educational Research and Review,* 2(5).
Barjak, F. (2006). "Research productivity in the internet era", *Scientometrics*, 68(3).
Barnett, B. (1992). "Teaching and research are inescapably incompatible" *Chronicle of Higher Education,* p. A40.
Bates, H. and Frohlich, C. (2001). The relationship between research Productivity and teaching effectiveness of finance faculty.
Bayer, J. (1977). Zur Semantik direktionaler Postpositionen. *Papiere zur Linguistik* 17/18.
Bellas, M. and Toutkoushian, R. (1999). "Faculty time allocation and research productivity: Gender, race, and family effects", *The Review of Higher education*, 22(4).
Bentley, R. and Blackburn, R. (1992). "Two decades of gains for female faculty", *Teachers College Record*, 93.
Baker III, H.; Bates, H.; Garbacik-Kopman. J. and McElDowney, J. (1998). "A Prelimary Investigation into the Correlation Between Teaching and Research in the Florida State University System", *Management Research News*, 21, (9).
Bates, H.; Garbacik-Kopman. J. and McElDowney, J. (1996). An Empirical Investigation into the Correlation Between Teaching and Research in the Florida State University System, Annual Meeting of the Southeast Regional Meeting, Richmond Virginia, April 25-27.
Becher, T. and Trowler, P. (2001). *Academic Tribes and Territories*. Buckingham: The Society for Research into Higher Education and Open University Press.
Biglan, A. (1973). "Relationships between subject matter characteristics and the structure and output of university Departments", *Journal of Applied Psychology*, 57(3).
Biswal, A. (2013). "An absolute index (Ab-index) to measure a researcher's useful contributions and productivity", *PloS One*; 8.
Bollen, J.; Van de Sompel, H.; Hagberg, A. and Chute, R. (2009). "A principal component analysis of 39 scientific impact measures", *PLoS ONE*; 4.
Bollen, J.; Marko A. and Van de Sompel, H. (2006). Journal status. [Online] Available: http://www.citebase.org/cgi-bin/fulltext?format=application/pdf (19 February, 2017).
Bordons, M.; Morillo, F.; Fernandez, M. and Gomez, I. (2003). *One step further in the production of bibliometric indicators at the micro level: Differences by gender and professional category of scientists.*
Bornmann, L. and Leydesdorff, L. (2013). "The validation of advanced bibliometric indicators through peer assessments: A comparative study using data from InCites and F1000", *J Informetr*; 7.
Bonaccorsi, A. and Daraio, C. (2003). "Age effects in scientific productivity: The case of the Italian National Research Council (CNR)", *Scientometrics*, Vol. 58, No. 1.
Boshoff, N. (2009). "Neo- colonialism and research collaboration in Central Africa", *Scientometrics* 81(2).
Bozeman, B. and Corley, E. (2004). "Scientists' collaboration strategies: implications for scientific and technical human capital", *Research Policy,* 33(4).

Blackburn, R. (1974) The meaning of work in academia. In J. I. Doi (Ed.), *Assessing faculty effort. New Directions for Institutional Research* (Vol. 2, pp. 75–99). San Francisco: Jossey-Bass.

Bharathi, D. (2013). "Evaluation and ranking of researchers–Bh index", *PloS One*; 8.

Braxton, J. (1996). "Contrasting Perspectives on the Relationship Between Teaching and Research"*, New Directions for Institutional Research*, 90.

Bradford, J. (2012). "A case study examining the reading habits and self-regulated study habits of gifted readers in the context of deep reading". PhD Thesis, Bagwell College of Education, Kennesaw State University, USA.

Braimoh, D. (1999). "Academics and African academia: A paradox of manufacturers and industries for development", *Higher Education Policy,* 12(3).

Bratsberg, B.; Ragan, Jr. and Warren, J. (2003). "Negative Returns to Seniority: New Evidence in Academic Markets.", *Industrial and Labor Relations Review*, Vol. 56, No. 2.

Brad, I. (2007). The 26 Major Advantages to Reading More Books and Why 3 in 4 People Are Being Shut Out of Success. [Online] Available: http://www.persistenceunlimited.com/2007/12/ (11 February, 2017).

Bloedel, J. (2001). "Judging research productivity on an entrepreneurial campus", *Evaluation Research Productivity,* 105.

Byrnes, J. (2007). "Publishing Trends of Psychology Faculty During Their Pre-tenure Years", *Psychological Science,* 18.

Budd, J. (2005). Faculty Publishing Productivity: Comparisons over Time. [Online] Available: http://crl.acrl.org/index.php/crl/article/download/15795/17241(21 February, 2017).

Carbon, C. (2011). "The Carbon_h-factor: predicting individuals' research impact at early stages of their-career", *PLoS One*; 6.

Creamer, E. (1998). *Assessing Faculty Publication Productivity: Issues of Equity*. ASHE-ERIC Higher Education Report Volume, 26, No. 2. Washington, DC: The George Washington University, Graduate School of Education and Human Development.

Creamer, E. (1995)." The scholarly productivity of women academics", *Initiatives,* 57(1).

Collins, L. (1998). Competition and contact: The dynamics behind resistance to affirmative action in academe. In L. H. Collins, J. C. Chrisler, and K. Quina (eds.), *Career Strategies for Women in Academe: Arming Athena*. Thousand Oaks, CA: Sage Publications.

Cole, J. (1979). Fair science: Women in the scientific community. New York: Columbia University Press.

Cortina, J. (1993). "What is coefficient alpha? An examination of theory and applications", *Journal of Applied Psychology*, 78.

Cresswell, J. (1985). *Faculty research performances: Lessons from the science and social sciences.* (ASHE-ERIC Higher education Report No.4). Washington, DC: Association for the Study of Higher Education.

Delzon, S.; Cochard, H. and Pfautsch, S. (2016). "Indexing the indices: scientific publishing needs to undergo a revolution", *Journal of Plant Hydraulics 3: e-009*

Demski, J. and Zimmerman, J. (2000). "On 'Research vs. Teaching': A Long-Term Perspective", *Accounting Horizons*, 14, No. 3.

Denchant, E. (1993). Roots and Wings. In B. E. Cullian (Ed.), *Pen Hand Children become Writers Network*.

Doiron, R. and Asselin, M. (2010). "Building a Culture for Reading in a Multicultural, Multilingual World". Paper presented at the World Library and Information Congress: 76th Ifla General Conference and Assembly held on August 10-15, 2010, Gothenburg, Sweden.

Duque, B.; Ynalvez, M.; Sooryamoorthy, R.; Mbatia, P.; Dzorgbo, D. and Shrum, W. (2005). "Collaboration paradox: scientific productivity, the Internet, and problems of research in developing areas", *Social Studies of Science*, *35(5),* 755-785.

Dundar, H. and Lewis, D. (1998). "Determinants of research productivity in higher education', *Research in Higher Education,* 39(6).

EasyCalculation software. [Online] Available: https://www.easycalculation.com/statistics/standard-deviation.php. (8 April, 2017).

Egghe, L. (2006)."Theory and practice of the g-index", *Scientometrics,* vol. 69.

European Commission (2012). She Figures 2012: Gender in research and innovation, ISBN 978-92-79- 27642-2

European Commission (1997). Second European Report on S&T Indicators, Luxembourg.

Fairweather, J.; Beach, A. (2002). "Variations in faculty work at research universities: implications for state and institutional policy", *The Review of Higher Education*, 26(1).

Feldman, K. (1987). "Research productivity and scholarly accomplishment of college teachers as related to their instructional effectiveness: A review and exploration", *Research in Higher Education*, 26(3).

Felder, R. (1994). "The Myth of the Superhuman Professor," *Journal of Engineering Education,* Vol. 83.

Feldman, K. "Research Productivity and Scholarly Accomplishment of College Teachers as Related to Their Instructional Effectiveness: A Review and Exploration," *Research in Higher Education,* Vol. 26.

Friedrich, R. and Michalak, S. (1983). "Why Doesn't Research Improve Teaching?" *Journal of Higher Education,* 54.

Fry, J. (2003). *The cultural shaping of scholarly communication within academic specialisms*. Unpublished Ph.D. thesis, University of Brighton.

Fooladi, M.; Salehi, H.; Yunus, M.; Farhadi, M.; Chadegani, A. and Farhadi, H. (2013). "Do Criticisms Overcome the Praises of Journal Impact Factor?", *Asian Social Science*, 9(5).

Forgues, B. and Liarte, S. (2013). "Academic publishing: Past and future", *M@n@gement*, 16.

Gaillard, J. (2010). "Measuring R&D in Developing Countries: Main Characteristics and Implications for the Frascati Manual", *Science, in Technology & Society*, Vol. 15(1).

Garfield, E. (1983). "Mapping Science in the Third World", *Science and Public Policy*, June.

George, D. and Mallery, P. (2003). SPSS for Windows step by step: A simple guide and reference, 11.0 update (4th ed.). Boston, MA: Allyn & Bacon.

Golden, J. and Carstensen, F. (1992). "Academic research productivity, department size and organization: Further results, comment", *Economics of Education Review*, 11(2).

Gonzalez-Brambila, C. and Veloso, F. (2007). "The determinants of research output and impact: A study of Mexican researchers", *Research Policy,* 36(7).

Gonzalez, S.; Davis, V.; Tennant, M.; Holmes, K. and Conlon, M. (2010). Letting the good times roll through alignment: meeting institutional missions and goals with VIVO, a web-based research discovery tool. In: *Proceedings of the Special Libraries Association Annual Conference, New Orleans, LA.* Washington (DC): Special Libraries Association.

Hamovitch, W. and Morgenstern, R. (1977). "Children and the productivity of academic women", *Journal of Higher Education* XLVII.

Hardy, M. and Bryman, A. (2009). Handbook of Data Analysis (1st Edition)**,** Springer, ISBN-13: 978-1848601161

Hattie, J. and Marsh, H. (2004).One journey to unravel the relationship between research and teaching. "Research and teaching: closing the divide?, An international colloquium, Centre, Colden Common Winchester, Hampshire, 18-19 March.

Hattie, J. and Marsh, H. (1996). "The Relationship Between Research and Teaching: A Meta-Analysis," *Review of Educational Research,* Vol. 66.

Hagedorn, L. and Sax, L. (1999). Marriage, Children, and Aging Parents: The Role or Family-Related Factors in Faculty Job Satisfaction. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada, April 1999.

Henry, D. and Neville, T. (2004). "Research, publication and service patterns of Florida academic librarians", *Journal of Academic Librarianship,* Vol. 30, no. 6.

Hirsch, J. (2005). "An index to quantify an individual's scientific research output", *Proc Natl Acad Sci* USA 102: 16569–16572

Horta, H. (2009). "Holding a post-doctoral position before becoming a faculty member: Does it bring benefits for the scholarly enterprise?", *Higher Education*, *58*(5).

Hutchins, B.; Yuan, X.; Anderson, J. and Santangelo, G. (2016). "Relative Citation Ratio (RCR): A New Metric That Uses Citation Rates to Measure Influence at the Article Level", *PLOS Biology*, DOI:10.1371/journal.pbio.1002541

Ifedili, C. (2009). "An assessment of reading culture among students in Nigerian tertiary-Institution a challenge to educational managers", *Reading Improvement*, 46(4).

Inklaar, R. and Timmer, M. (2009). GGDC productivity level database: international comparisons of output, inputs and productivity at the industry level. Groningen Growth and Development Centre University of Groningen. The Netherlands.

Javitz, H.; Grimes, T.; Hill, D.; Rapoport, A.; Bell, R.; Fecso, R. and Lehming, R. (2010). *U.S. Academic Scientific Publishing.* Working paper SRS 11-201. Arlington, VA: National Science Foundation, Division of Science Resources Statistics.

Jenkins, A. (2004). A Guide to the Research Evidence on Teaching-Research Relations, Heslington, England: The Higher Education Academy.

Jönsson, A. and Olsson, J. (2008). Reading culture and literacy in Uganda: The case of the "Children's Reading Tent. Masters thesis, Högskolan Iborås, Vetenskap för Profession. [Online] Available: http://bada.hb.se/bitstream/2320/3405/1/08-7.pdf (18 April, 2017).

Jinha, A. (2010). "Article 50 million: an estimate of the number of scholarly articles in existence", *Learned Publishing*, Vol. 23, No. 3.

Junuis, R. (2009). Reading in Second Language. Oxford .Oxford university press.

Kaberia, J. (2012). "Reading Culture in Kenya: A situation to worry about?", *Goethe-Institut Kenya.* [Online] Available: http://www.goethe.de/ins/ke/nai/kul/mag/bib/les/.htm (12 April, 2017).

Kapp, A. and Albertyn, R. (2008). "Accepted or rejected: Editors' perspectives on common errors of authors", *Acta Academica*, 40(4).

Kothari C. (2005). *Research Methodology, Methods and Techniques*, 2nd edition. New Age International (P) Limited Publisher. New Delhi.

Kothari, C (2004). Research methodology: methods & techniques, New Delhi: New Age International (P) Ltd.

Kotrlik, J.; Bartlett, E.; Higgins, C. and Williams, H. (2002). "Factors associated with research productivity of agricultural education faculty", *Journal of Agricultural Education,* 43(3).

Keith, B.; Layne, J.; Babchuck, N. and Johnson, K. (2002). "The context of scientific achievement: Sex status, organizational environments, and the timing of publication on scholarship outcomes", *Social Forces*, *80*(4).

Khan, N.; Thompson, C.; Taylor, D. *et al.* (2013). Part II: Should the h-index be modified? An-analysis of the m-quotient, contemporary h-index, authorship value, and impact factor. World Neurosurg; 80.

Kusure, L.; Mutanda, L.; Mawere, D. and Dhliwayo, L. (2006). "Factors influencing research productivity among lecturers in teachers' colleges in Zimbabwe", *Southern African Journal of Education Science and Technology,* 1(2).

Kyvik, S. (1990). "Age and scientific productivity. Differences between fields of learning", *Higher Education,*19.

Kyvik, S. (1991). *Productiviy in Academia. Scientific publishing at Norwegian universities.* Oslo: Universitetsforlaget.

Kyvik, S. (1993). Academic staff and scientific production. *Higher Education,* 5.

Kyvik, S. and Teigen, M. (1996). "Child Care, Research Collaboration, and Gender Differences in Scientific Productivity", *Science, Technology, & Human Values,* 21(1).

Kurtz, M. and Henneken, E. (2007). Open access does not increase citations for research articles from the astrophysical journal. arXiv. [Online] Available: http://arxiv.org/abs/0709.0896v1(15 February, 2017).

Kungl (2012). "Review of literature on scientists' research productivity", KUNGL. INGENJÖRSVETENSKAPSAKADEMIEN (IVA), Stockholm, ISSN: 1102-8254.

Larivière, V.; Vignola-Gagné, E.; Villeneuve, C.; Gélinas, P. and Gingras, Y. (2011). "Sex differences in research funding, productivity and impact: An analysis ofQuebec university professors", *Scientometrics*, 87(3).

Lee, S. and Bozeman, B. (2005). "The impact of research collaboration on scientific productivity", *Social Studies of Science,* 35 (5).

Lehman, H. (1953). *Age and Achievement*: Princeton University Press.

Levin, S. and Stephan, P. (1991). "Research productivity over the life cycle: evidence for academic scientists", *American Economic Review*, 81 (1).

Long, S. and McGinnis, R. (1981). "Organizational context and scientific productivity", *American Sociological Review,* 46.

Long, J. (1990). "The origins of sex difference in science", *Social Forces*, 64.

Long, J. (1992). "Measures of sex differences in scientific productivity", *Social Forces*, 71(1).

Lotka, A. (1926). The frequency distribution of scientific productivity. *Journal of the Washington Academy of Sciences,* 16(12).

Lichtenberg, J. (1997). "University Professors Wonder: Will 'Publish or Perish' Perish?", *Publishers Weekly*, V.244, No.42.

Luo, A. and Olson, J. S. (2008). How collaboratories affect scientists from developing countries. In G. M. Olson, A. Zimmerman, and N. Bos (Eds.) *Scientific Collaboration on the Internet.* Cambridge, MA: MIT Press.

Mabe, M. and Amin, M. (2002). "Dr Jekyll and Dr Hyde: author-reader asymmetries in scholarly publishing", *ASLIB Proceedings*, Vol. 54, No. 3.

Marsh, H. (1987). "Students' evaluations of university teaching: Research findings, methodological issues, and directions for further research", *International Journal of Educational Research,* 11.

Marsh, H. and Hattie, J. (2002). "Complementary, Antagonistic, or Independent Constructs?" *The Journal of Higher Education,* Vol. 73, No. 5.

Magoha G. (2006). "Science Technology and Innovation for Africa's development", *Journal of Discovery and Innovation* .;18(3).

Massy, W. and Wilger, A. (1995). "Improving productivity: What faculty think about it—and its effect on quality", *Change,* 27.

Merton, R. and Zuckerman, H. (1973). Age, aging and age structure in science. In R. K. Merton (Ed.), *The Sociology of Science*. Chicago: The University of Chicago Press.

Merton, R. (1968). "The Matthew effect in science", *Science*, 159 56.63.

Moed, H. (2005). Citation analysis in research evaluation. Springer: Dordrecht, The Netherlands.

Moed, H. (2007). "The effect of 'Open Access' upon citation impact: An analysis of ArXiv's condensed matter section", *Journal of the American Society for Information Science and Technology*, 58(13).

Meyer, K. (1998). *Faculty workload studies: Perspectives, needs, and future directions*. ASHE-ERIC Higher

Education Report No. 1. Washington, DC: George Washington University, Graduate School of Education and Human Development.
Melland, H. (1996)."Great Researcher…Good Teacher*?", Journal of Professional Nursing*, 12, (1).
Mosha, H. (1986). "The role of African universities in national development: A critical analysis", *Comparative Education,* 22(2).
Mouton, J. (2008) *Regional Report on Sub- Saharan Africa.* A meta- review produced for the Symposium on Comparative Analysis of National Research Systems, 16–18 January 2008. Paris: UNESCO.
Middaugh, M. (2001). *Understanding faculty productivity: Standards and benchmarks for colleges and universities*. San Francisco: Jossey-Bass.
Michaux, L: Harlem book seller *https://zinnedproject.org/materials/lewis-michaux-harlem-bookseller/*
Muia, A. and Oringo, J. (2016). "Constraints on research productivity in Kenyan universities: case study of University of Nairobi, Kenya", *International Journal of Recent Advances in Multidisciplinary Research,* Vol. 03, Issue 08.
Muriithi, P.; Horner, D. and Pemberton, L. (2013). Understanding Factors Influencing the Effect of Scientific Collaboration on Productivity in a Developing Country: Kenya. *ASIST 2013,* November 1-6, 2013, Montreal, Quebec, Canada.
Mugenda O. and Mugenda G. (2010). R*esearch Methods, Quantitative and Qualitative Approaches.* Nairobi ACTS Press
Muriithi, P. (2015). Academic research collaborations in Kenya: structure, processes and information technologies; PhD dissertation, University of Brighton.
Nalusiba, P. (2010). Strategies for the development of a reading culture in Uganda primary schools: Case studies of four selected Universal Primary Education schools in Kampala district. Masters thesis, Makerere University.
Neumann, B. (1992). "Perceptions of the teaching-research nexus: A framework for analysis", *Higher Education,* 23.
Nyberg, L.; Lövdén, M.; Riklund, K.; Lindenberger, U. and Bäckman, L. (2012). "Memory aging and brain maintenance", *Trends in cognitive sciences*, 16(5).
OECD (2010). Education at a Glance 2010: OECD Indicators, [Online] Available: http://www.oecd.org/dataoecd/45/39/45926093.pdf (23 April, 2017).
Ogwu, M. (2010). "Reading culture as a tool for promoting educational development in Nigeria", *Journal of Communication and Culture: International Perspective*, 1(3).
Okebukola, F. (2004). *Reading: Key to lifelong development*. A key note address delivered at the workshop on readership promotion campaign organized by the National Library Nigeria Press.
Okiki, O. (2013). Research productivity of teaching faculty members in Nigerian federal universities: An investigative study. *Chinese Librarianship: an International Electronic Journal*, 36.
Ondari-Okemwa, E. (2007) Scholarly publishing in Sub-Saharan Africa in the twenty-first century: Challenges and opportunities. First Monday, 12 July.
Otike, F. (2011). "Reading culture, cultivation and its promotion among pupils: a Kenyan perspective". *International Research Journal of Library, Information and Archival Studies,* 1(1).
Owusu-Acheaw, M. (2014). "Reading habits among students and its effect on academic- performance: A study of students of Koforidua Polytechnic'. *Library Philosophy and Practice (e-journal).* Paper 1130.
Paglia, C. (1991). Sexual Personae: Art and Decadence from Nefertiti to Emily Dickinson, Vintage, New York, NY.
Porter, S. and Umbach, P. (2001). "Analyzing faculty workload data using multilevel-modeling", *Research in Higher Education*, 42(2).
Price, E.; Powe, N.; Kern, D.; Golden, S.; Wand, G. and Cooper, L. (2009). "Improving the diversity climate in academic medicine: faculty perceptions as a catalyst for institutional change", *Acad Med*.; 84 (1).
Prpic, K. (2002). "Gender and productivity differentials in science", *Scientometrics*, 55(1).
Puuska, H. (2010). "Effects of scholar's gender and professional position on publishing productivity in different publication types. Analysis of a Finnish university", *Scientometrics*, 82(2).
Radicchi, F.; Fortunato, S. and Castellano, C. (2008). "Universality of citation distributions: toward an objective measure of scientific impact", *Proc Natl Acad Sci U S A*, 105.
Ramesh, B. and Singh, Y. (1998). Determinants of research productivity. *Scientometrics,* 43(3).
Ramsden, P. and Moses, I.(1992). "Associations between Research and Teaching in Australian Higher Education"*, Higher Education*, 23, (3).
Rennie, D. and Flanagin, A. (2014). "Research on peer review and biomedical publication: furthering the quest to improve the quality of reporting", *JAMA*, 311.
Reskin, B. (1977). "Scientific productivity and reward structure of science", *American Sociological Review*, 42(3).

Rorstad, K. and Aksnes, D. (2013). Publication productivity expressed by age, gender and academic position – An analysis on Norwegian scientists. In Translational twists and turns: Science as a socio-economic endeavor. Proceedings of STI 2013 (pp. 319–334). Berlin: iFQ.

Ribeiro dos Santos, P.; Rancez, M.; Prétet, J-L.; Michel-Salzat, A.; Messent, V.; Bogdanova, A. *et al.* (2011).” Rapid Dissemination of SIV Follows Multisite Entry after Rectal Inoculation”, *PLoS ONE*, 6(5).

RIN (2009). A Research Information Network report. Communicating knowledge: How and why UK researchers publish and disseminate their findings. [Online] Available: www.rin.ac.uk/communicating-knowledge (11 February, 2017).

Rugarcia, A. (1991). “The Link Between Teaching and Research: Myth or Possibility?” *Engineering Education,* Vol. 81.

Ruterana, P. (2012a). “Enhancing the culture of reading in Rwanda: Reflections by students in tertiary institutions”, *The Journal of Pan African Studies*, 5(1).

Ruterana, P. (2012b). “The making of a reading society: Developing a culture of reading in Rwanda”, *Linköping Studies in Behavioural Science*, No. 165, 1:1 edn, LiU-Tryck, Linköping Sweden.

Sax, L.; Hagedorn, L.; Arredondo, M. and Dicrisi, F. (2002). “Faculty research productivity: Exploring the Role of Gender and Family-Related Factors”, *Research in Higher Education,* Vol. 43, No. 4.

Sax, L.; Astin, A.; Korn, W. and Gilmartin, S. (1999). *The American College Teacher: National Norms for the 1998–99 HERI Faculty Survey*. Los Angeles: Higher Education Research Institute, UCLA.

SBF (2007). Stable Bloom Filters for streaming data. In ACM SIGMOD’06.

Schneider, Z. and Whitehead, D. (2013). “Nursing and Midwifery Research: Methods and Appraisal for Evidence-based Practice”, *Journal Nature*, 2/24.

Schubert, A. and Braun, T. (1986). “Relative Indicators and relational Charts for comparative Assessment of Publication Output and Citation Impact”, *Scientometrics,* 9(5-6).

Seliger, G. *et al.* (eds.) (2011). *Advances in Sustainable Manufacturing: Proceedings of the 8th Global Conference on Sustainable Manufacturing*, Berlin Heidelberg.

SoftKenya.com: Kenya Education-Reading Culture in Kenya

Sharma, B.; Boet, S.; Grantcharov, T.; Shin, E.; Barrowman, N.; Bould, M. (2013). “The h-index outperforms other bibliometrics in the assessment of research performance in general surgery: a province-wide study”, *Surgery*;153.

Shaw, D. and Vaughan, L. (2008). Publication and Citation Patterns among LIS Faculty: Profiling a “Typical Professor” , University of Western Ontario, London, Ontario, N6A 5B7, Canada,

Sheridan, D. (2005). “Reforming research in the NHS”, *BMJ* ; 331.

Shin, J. and Cummings, W. (2010). “Multi-level analysis of academic publishing across discipline: Research performance, collaboration, and time on research”, *Scientometrics*, 85(2). http://dx.doi.org/10.1007/s11192-010-0236-2

Skirbekk, V. (2003). Age and Individual Productivity: A Literature Survey, MPIDR working paper, WP 2003-028.

Starovoytova, D. (2017d). “Scientific Research, Writing, and Dissemination (Part 4/4): Dissemination of Scholarly-Publications”, *Journal of Education and Practice (U.S.A.)*, ISSN 2222-1735 (Paper), ISSN 2222-288X; Vol.8, No.28.

Starovoytova, D. (2017c).”Scientific Research, Writing, and Dissemination: (Part 3/4)-Scientific Writing”, *Journal of Education and Practice (U.S.A.)*, ISSN 2222-1735 (Paper), ISSN 2222-288X. Vol. 8, `No.28.

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

Starovoytova, D. (2017a). “Scientific Research, Writing, and Dissemination: (Part 1/4) - Boosting Research Quality*”, Journal of Education and Practice (U.S.A.)*, ISSN 2222-1735 (Paper), ISSN 2222-288X; Vol. 8, No. 22.

Starovoytova, D. (2017e). “Plagiarism under a Magnifying-Glass”, *Journal of Education and Practice (U.S.A.)*, Vol.8, No.13, ISSN 2222-1735 (Paper), ISSN 2222-288X.

Starovoytova, D. and Namango, S. (2017). “Awareness of Engineering Faculty on Plagiarism”, *Research on Humanities and Social Sciences (U.S.A.)*, ISSN (Paper) 2224-5766 ISSN (Online) 2225-0484 (Online), Vol.7, No.7.

Starovoytova, D. and Cherotich, S. (2016a). “Analysis of Masculinities Across Engineering Disciplines”, *Research on Humanities and Social Sciences*, Vol.6, No.18, ISSN 2224-5766(Paper).

Starovoytova, D. and Cherotich, S. (2016b). “Female Underrepresentation in Undergraduate Education: Case study in School of Engineering”, *Research on Humanities and Social Sciences*, ISSN 2224- 5766(Paper), ISSN 2225-0484 (Online), Vol.6, No.14.

Starovoytova, D. and Cherotich, S. (2016c). “Challenges Faced by Female-Students in Engineering-Education”, *Journal of Education and Practice (U.S.A.)*,ISSN 2222-1735 (Paper) ISSN 2222-288X (Online), Vol.7, No.25, 2016.

Starovoytova, D. and Namango, S. (2016 a). "Faculty perceptions on cheating in exams in undergraduate engineering", *Journal of Education& Practice*, Vol.7, No.30, ISSN 2222-1735 (Paper), ISSN 2222-288X (Online).

Starovoytova, D. and Namango, S. (2016 b). "Perceptions of female high school students on engineering", *Journal of Education & Practice*, Vol.7, No.25; ISSN 2222-1735 (Paper) ISSN 2222-288X (Online).

Starovoytova, D. and Namango, S. (2016c). "Viewpoint of Undergraduate Engineering Students on Plagiarism", *Journal of Education and Practice (U.S.A.)*, ISSN 2222-1735 (Paper) ISSN 2222-288X (Online), Vol.7, No.31.

Starovoytova, D.; Tuigong, D.; Sitati, S.; Namango, S. and Ataro, E. (2015). "Potential of Theory of Innovative Problem Solution (TRIZ) in Engineering Curricula", *International Journal of Innovative Science, Engineering & Technology*, Vol. 2 Issue 5, ISSN 2348 –7968.

STM (2015). International Association of Scientific, Technical and Medical Publishers Fourth Edition, published by Prins Willem Alexanderhof 5, The Hague, 2595BE, The Netherlands.

Stephan, P. and Ma, J. (2005). "The increased frequency and duration of the post-doctoral career stage", *The American Economic Review*, 95(2).

Stringer, M.; Sales-Pardo, M. and Amaral, L. (2010). "Statistical validation of a global model for the distribution of the ultimate number of citations accrued by papers published in a scientific journal". *J Am Soc Inf Sci Technol* ; 61.

Simon, H. (1957). Models of Man, John Wiley and Sons, NY.

Sulo, T.; Kendagor, R.; Kosgei, D.; Tuitoek, D. and Chelangat, S. (2012). "Factors Affecting Research Productivity in Public Universities of Kenya: The Case of Moi University, Eldoret", *Journal of Emerging Trends in Economics and Management Sciences (JETEMS),* 3(5).

Summers, J. (2001). "Guidelines for conducting research and publishing in marketing: From conceptualization through the review process", *J. Acad. Mark. Sci*., 29(4).

Sullivan, S. (1996). "Scholarly Publishing: Trash or Treasure?", *Australian Academic & Research Libraries*, 27:1.

Tancheva, K.; Gessner, G.; Tang, N.; Eldermire, E.; Furnas, H. and Branchini, D. (2016). *A day in the life of a (serious) researcher: Envisioning the future of the research library*. New York, NY: Ithaka.

Tanner, J.; Manakyan, H. and Hotard, D. (1992). "Management-Faculty Productivity and Perceived Teaching Effectiveness", *Journal of Education for Business*, May/June.

Tenopir, C. and King, D. (2000). *Towards Electronic Journals: Realities for Scientists, Librarians and Publishers*, Washington DC, Special Libraries Association.

Teodorescu, D. (2000). "Correlates of faculty publication productivity: A cross-national analysis", *Higher Education,* 39.

Toncich, D. (2013). *Key factors in postgraduate research: A guide for students* (3rd ed.). Brighton, Australia: Chrystobel Engineering.

Tien, F. and Blackburn, R. (1996). "Faculty rank system, research motivation, and faculty research productivity", *The Journal of Higher Education*, 67(1).

Tijssena, R. (2007). "Africa's contribution to the worldwide research literature: New analytical perspectives, trends, and performance indicators", *Scientometrics, Vol. 71, No. 2*

Turner, S. and Chubin, D. (1979). "Chance and eminence in science: Eclesistes II", *Social Science Information*, 18.

UN (2016). Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators (E/CN.3/2016/2/Rev.1).

UIS (2005). "What do bibliometric indicators tell us about world scientific output?" *Bulletin on Science and Technology Statistics*, issue no 2, September 2005, UNESCO Institute for Statistics, Montreal.

Umanath, S. and Marsh, E. (2014). "Understanding how prior knowledge influences memory in older adults", *Perspectives on Psychological Science*, 9(4).

Vakkari, P. (2008). "Perceived influence of the use of electronic information resources on scholarly work and publication productivity", *Journal of the American Society for Information Science and Technology,* 59(4).

Van Arensbergen, P.; van der Weijden, I., and van den Besselaar, P. (2012). "Gender differences in scientific productivity: A persisting phenomenon?" *Sciento-metrics*, 93(3).

Van Noorden, R. (2014). "Publishers withdraw more than 120 gibberish papers", Elsevier Australia.

Veysey, L. (1965). *The Emergence of the American University*, Chicago, IL: University of Chicago Press.

Vijayaragavan, P.; Singh, P.; Burman, R. and Chahal, V. (2017). "Determinants of research productivity of agricultural scientists: implications for the national agricultural research and education system of India", *Current Science*, Vol. 112, no. 2.

Ward, K. and Grant, L. (1996). Gender and academic publishing. In J. C. Smart (Ed.), Higher education, handbook of theory and research (Vol. XI). New York:Agathon Press.

Ware, A. and Mabe, N. (2015). The STM Report: An overview of scientific and scholarly journal publishing, International Association of Scientific, Technical and Medical Publishers, Prins Willem Alexanderh of 5, The Hague, 2595BE, The Netherlands.

Walker, D.; Xie, H.; Yan, K-K. and Maslov, S.(2007). "Ranking scientific publications using a model of network traffic", *J Stat Mech Theory Exp*, P06010–P06010. doi: 10.1088/1742- 5468/2007/06/P06010

Waltman, L.; van Eck, N.; van Leeuwen, T.; Visser, M. and van Raan, A. (2011). "Towards a new crown indicator: Some theoretical considerations", *J Informetr*; 5.

Waltman, L.; Calero-Medina, C.; Kosten, J.; Noyons, E.; Tijssen, R.; van Eck, N.; van Leeuwen, T.; van Raan, A.; Visser, M. and Wouters, P. (2013). "The Leiden ranking 2011/2012: Data collection, indicators, and interpretation", *Journal of the American Society for Information Science and Technology,* 63(12).

Waswa, F.; Ombuki, C.; Migosi, G. and Metet, J. (2013). "Assessment of corporate management practices in public universities in Kenya", *International Journal of Educational Administration and Policy Studies*, Vol. 5(2).

Webber, K. (*nd*). Measuring Faculty Productivity. [Online] Available: http://ihe.uga.edu/uploads/publications/faculty/Webber_Chp6_MeasuringFacProd.pdf (12 February, 2017).

Webster, D. (1986). "Research productivity and classroom teaching effectiveness", *Instructional Evaluation,* 9.

Weimer, M. (1997). "Integration of Teaching and Research: Myth, Reality, and Possibility," *New Directions for Teaching and Learning,* Vol. 72.

Wray, K. (2003). "Is science really a young man's game?" *Soc Stud Sci,* 33.

Worsham, L. (2008). "What editors want?", *Chronocle of higher education*.

Wolszczak-Derlacz, J. and Parteka, A. (2010). Scientific Productivity of Public Higher Education Institutions in Poland: A Comparative-Bibliometric Analysis; Published by Ernst & Young Polska, Poland; ISBN: 978-83-908870-1-2

Whitley, R. (2000). *The intellectual and social organization of the sciences*. Oxford, UK. Oxford University Press.

Zeleza, P. (2005). The academic Diaspora and knowledge production in and on Africa: what role CODESRIA? In Makandawire, T. Ed. African intellectuals: rethinking politics, language, gender and development. Dakar: CODESRIA.

Xie, Y. and Shauman, K. (1998). "Sex differences in research productivity: New evidence about an old puzzle", *American Sociological Review*, 63(6).

Zitt, M. and Small, H. (2008). "Modifying the journal impact factor by fractional citation weighting: The audience factor", *J Am Soc Inf Sci Technol* ; 59.