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Identifying and formulating the keys of ideal research strategies

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Abstract

Research is basically undertaken to increase the stock of our knowledge on humanity, culture and relevant society. The primary purposes of research is to document, discover or interpret novel ideas, methods and systems to develop new and emergent areas of research themes that might cross the traditional boundaries of our knowledge to facilitate cross-school level working through coordination among Universities and research institutes world-wide. Research topic selection, identification and establishment of definitive aims and objectives, keyword searching tools to find research methodologies, use of periodical indexes and abstracts in libraries and internet resources to find valid citations, evaluation of research using standard formats and iteration process of research etc. are considered as the effective strategies for a successful research. The present investigation focuses on the keys to research strategies that are considered as fundamental to maintain the quality and performance of successful research and development in academics and research institutes.

Keywords: Citation, cross-school level, iteration process, periodical indexes, scientific research, successful research.

1. Introduction

Research is defined as a step-wise data collection process that has to be analyzed and published to increase the knowledge on a particular topic or issue ^[1]. The Merriam-Webster Online Dictionary ^[2] defines research as a studious inquiry or examination process especially aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of novel facts. Most of the researches generally begin with a general statement of the research problem ^[3]. The literature review then identifies the flaws or holes in previous research that provides justification for conducting the present investigation. A gap in the current literature, as identified by the researcher, then generates a research question. The research question may be parallel to the research hypothesis that is supposed to be tested and interpreted with the help of collected information through data analysis via statistical methods. The results of the data analysis are reported and substantially evaluated and published. Thus, identification of the research problem, literature review, specifying the purpose of research to design it, determining the specific research questions to test the hypotheses, data collection, analyze and interpretation followed by proper evaluation and valid research publications etc. are considered as the essential steps while conducting a research process ^[1] (Fig. 1).

Several forms of research such as scientific research, research in humanities, artistic, economic, social, business, marketing and practitioner research etc. are there. Scientific research, which is usually funded by public authorities, Govt. organizations or private groups, is mainly based on scientific information and theories to explain the properties of nature. Thus, it is widely used criterion to judge the standard of an academic institution as well as business schools. Research in the humanities, involves the exploration of issues or details of a particular problem that surrounds it rather than searching for the ultimate answer to a specific question. Scholars' in humanities for the purpose apply methods like hermeneutics and semiotics. An example of research in the humanities is historical research, which is embodied in historical methods. Here, researchers use primary sources and other necessary evidences to systematically investigate a topic or to write histories in the form of past accounts. Artistic research is often known as 'practice-based research' whose main aim is

to enhance the knowledge and understanding on a particular research problem with artistic presentations. According to the University of Dance and Circus ^[4], Stockholm this type of research is generally made to investigate and test the purpose of gaining knowledge within the artistic disciplines through proper and systematic practicing methods and criticality. However, the main objective of a research process is to produce new knowledge to strengthen the basics on a

particular research topic or issue. Three main forms of researches like explanatory, constructive and empirical researches are usually involved while identifying and defining a research problem, testing the hypothesis of a particular theory and to propose solutions to a particular problem or question as well as to test the feasibility of a research solution.

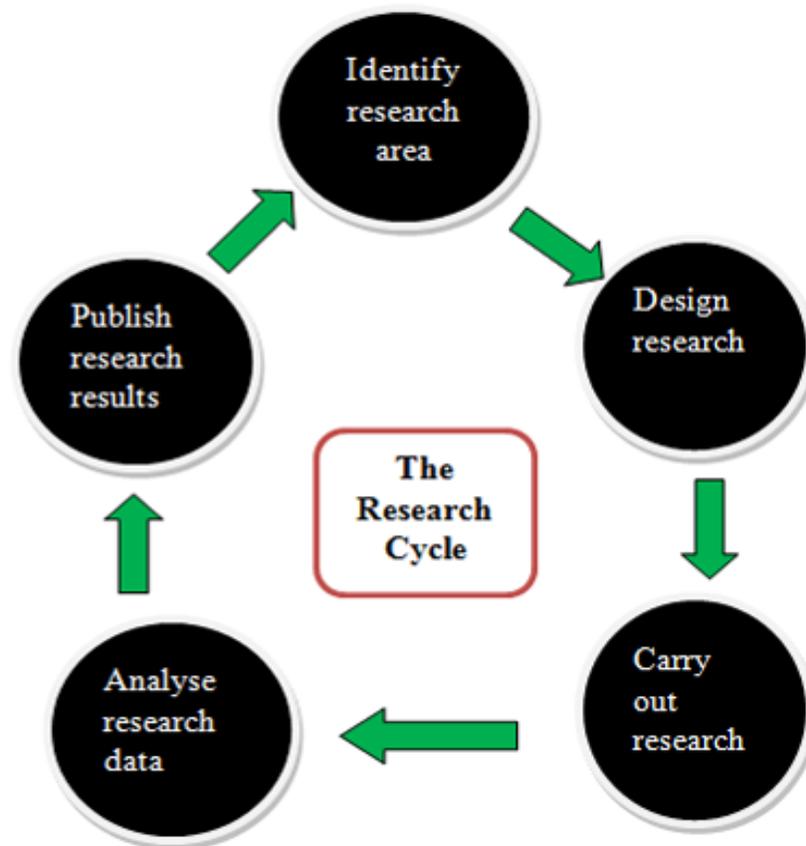


Fig 1: The research cycle.

2. Research evaluation

The major criteria that are used to evaluate research can be grouped under two headings like reliability and validity ^[5]. In general, reliability is the ability of a person or system to perform and maintain its functions in routine circumstances. In scientific research, reliability is considered as the degree to which a measure is free of measurement error. Assessment of reliability is usually performed by looking at the consistency of a measure. For instances, a reliable weight scale would produce a consistent weight estimate for the same object over time. A reliable measure of playground aggression would produce consistent aggression estimates for the same child across several observers. There are several types of research validities such as internal, external and construct validity which might play an essential role in making evaluations on specific research problems. Internal validity tests the confidence in making cause-and-effect conclusions from the results of one's investigation. For example, suppose someone is going to determine if cigarette smoking is responsible for lung cancer or not. Here, the problem is that there may be many possible reasons of lung cancer like environmental toxins, genetic predispositions etc. Internal validity is able to rule out the alternative causes of

cancer in the case and thereby could substantially conclude one factor alone (in this case, smoking) in producing cancer. External validity is the confidence while generalizing the findings of one's study. Construct validity, on the other hand, is the confidence one might have while representing the theoretical constructs in his study (e.g., time pressure, anger etc.) that can be accurately represented by real world methods. Hypothesis-testing and exploratory research is the two basic methodologies that could improve the falsifiability of research evaluation.

3. Recognition of research activities: the good and the bad

Activity recognition in research is a relatively young field although a wide variety of machine learning techniques such as decision trees, Bayes classifiers and nearest-neighbour algorithms have been developed for research activity recognition ^[6]. A mutual set of activities and definitions would help the researchers to collect and label the ground truth in a standard way. However, no one could agree on prior probabilities for research activities. It is, thus, difficult to build a theory on past work and leverage classifiers that others have trained. This is particularly important for the

researchers interested in building prototypes that could control activity recognition. Exploration of fundamental building blocks of activity recognition could be more appropriate enough for evaluating the quality of research by authorized research communities in Universities or other academic institutes.

For activity reorganization, one must have first defined a set of research activities to recognize that might be later augmented or expanded if necessary. This is helpful to exploit the existing common sense reasoning works like the Cyc project [7]. Location creating to host the shared datasets or even just an index listing to specify the locations would make it easier for other researchers to leverage the shared data. It would also be courteous to explore methods for recognizing and rewarding the extra effort necessary to provide the shared data to other researchers in the community. Finally, pervasive computing has also a long history of research to explore ways to encourage applications that could recognize the activity of research applications. Collecting annotated sensor data can be a challenge for activity recognition where researchers have to provide their datasets that might be used by others, while pervasive computing applications.

4. SMART: the fundamentals of successful research

A successful research paper can increase readers' knowledge on a particular research topic. To make the event successful, one must accurately, concisely and more comprehensively relay the unbiased information on the topic. SMART is a good way to remember the fundamentals of successful research writing [8]. SMART stands for specific, measurable, attainable, realistic and time.

Specific: A research paper which is based on a research problem should be specific, concentrating its focus on the given area of research and thereby could answer all the specific research questions rather aimless to convey information or make claims on unrelated topics or subjects.

Measurable: A successful research paper should cite all the relevant research sources and literatures, usually used by prior workers on the topic while writing his research paper.

Attainable: The statements of a research paper must reflect a thesis, one that answers the research questions and contributes to the knowledge on the given subject. Thus, a good research paper mustn't propose to answer a question that doesn't based on the knowledge of real life or existing body.

Realistic: A research paper should have a definitive aim and it should be realistic to make interpretations, arguments or evaluations, based on valid evidence from reliable sources.

Time: Time is one of the significant factors to be considered while performing a good research activity. It is of no use to write a research paper without knowing the research limits, timeframes and overall focus on the required work.

5. Development of successful research strategies: key elements

Research lies at the heart of a university's life and, thus, it has a tremendous contribution in society. It informs and underpins the teaching processes and thereby helps in

producing skilled, intellectually adept and employable graduates. The transfer of knowledge, usually attained through research can aid economic growth and prosperity and, thus, helps to develop innovative modern technologies and practice based intervention that might contribute significantly for better public policy, social and cultural understandings and advancement of social justice. Researchers have to consider many elements to develop a research process. The following keys could outline simple and effective strategies for successful research activities [9-13].

5.1 Identification and development of a research topic

A research topic should be designed to find out a research question. Main concepts or keywords in the research question are then identified and screened in sequence based on their prime importance by looking them in the appropriate sources like periodical indexes, journals and subject encyclopaedias as search items.

5.2 Use of catalogs to find books and media

Literature review is made to find the materials on a particular research topic or subject in order to distinguish the existing knowledge. Book-length bibliographies and annual reviews on the subject areas are searched here.

5.3 Application of indexes to find periodicals

Periodicals are continuous publications such as journals, newspapers, or magazines. Periodical indexes are used to find the individual periodical articles by subject, article author name, or article title etc.

5.4 Finding of additional internet resources

Google and its branches like Google scholar, Google books, Google news, Google maps, you tube, etc., have to be searched to find the relevant information and literature on the chosen research area.

5.5 Experiment design

Standard research methodologies must be adopted to design the research experiment. Sampling and data collection processes, conducting interviews or surveys and data analyses through statistical methods are the important steps in formulating the research experiments and design.

5.6 Research evaluation

Evaluating the usefulness and reliability of research output is a crucial step in the process of formulation of successful research, which is usually undertaken by considering the appropriateness of one's research in a particular authenticated book, article, journal, periodical, media resource or Web site.

5.7 The "iterative" process of research

Ultimately, the key to a successful research process lies in iteration. This is the step of returning again and again of one's research question, methods and data which, might leads to novel ideas, revisions and improvements. The more one examine his study methods and data from different viewpoints, the more complexity he may reveal which will undoubtedly lead to a strong and better-conceptualized research output.

The University research strategy [14] has developed the key objectives of research:

- To retain and reward high quality researchers and attract internationally respected research leaders.
- To support existing and to promote novel and emergent areas of research that might cross the boundary of traditional subject to facilitate cross-school working through research institutes or academics.
- To facilitate the agile and strategic allocation of resources in order to make the advantage of research strengths, opportunities and the emergent priorities of a variety of commercial opportunities.
- To develop strategic collaborations and partnerships both nationally and internationally.
- To ensure external funding from diverse Govt. and private research funding sources sufficient to derive a sustainable research and knowledge transfer base.
- To deliver the University's mission to make available its research and knowledge to diverse communities close working with regional and national agencies with their strategic priorities.
- to increase the success rate of postgraduate research students as a measure of research culture and thereby serves as significant contributors in future knowledge production system within and out of the University.
- To establish the policies and support mechanisms for successful research activities that could help in acquiring sufficient grant applications, sound project and effective management systems.

6. Standard formats of an ideal research paper

There are standard formats of research paper writing which are considered as the essential components of a good and successful research paper. The guidance points^[8] include:

Title

Each research paper must have an informative title that should reflect the aims as well as findings of the proposed work. There should be a title page, with the alignment of the actual title of the paper typically centered.

Table of contents

A research paper should essentially have the table of contents with page numbers for each section of experiments, findings, data interpretations etc.

Introduction

A research paper must necessarily start with a general introduction focusing the importance of research topic in the light of present scenario. Thus, the introduction of a research paper should explain and justify the reason of selection of one's research area. To support and understand the queries on particular research theme the introduction also deals with the relevant literatures published by different workers in different time.

Materials and methods

Research methodologies based on outdated or disapproved material generally weakens the credibility of research. This part of research paper, therefore, states and explains the valid and up-to-date methodologies that are primarily needed to design the entire course experiments of one's research by mean of which data and evidence could be collected, organized and analyzed properly in a standard and acceptable format.

Results and Discussion

This is the part of research where the researchers have to logically report and analyze the research findings and substantially discuss and interpret it with the assist of already published data and literatures. Research findings can be well presented by using several techniques which includes use of tables, graphs, quotations, illustrations, examples, words of emphasis or other additional supporting evidences etc.

Conclusion

Conclusion summarizes the results and major findings of research activities. It should not include anything that hasn't been pointed out in the results and discussion component of a research paper.

References

This component of research writing cites all the references included in the research paper either in the form of testimony, statistics, direct quotes or paraphrased information. It is vital to check that all the citations included in the main text should be present in this section in order to make one's research more valid and discipline.

Acknowledgement

This is the part of successful research writing where the researcher should acknowledge the funding organizations or anyone who is directly or indirectly associated with the successful completion of his/her research.

7. Plagiarism

Plagiarism is the wrongful appropriation, purloining and publication of another author's language, thoughts, ideas or expressions as the representations of one's own original work (Fig. 2). Oxford University^[15] characterized plagiarism as the use of "a writer's ideas or phraseology without giving due credit." Brown University^[16] defines plagiarism as the appropriating of one person's ideas or words without attributing those words or ideas to their true source. It is, thus, considered as academic dishonesty and a breach of journalistic ethics leading to development of significant barriers in performing successful research activities. The idea of research often remains problematic with unclear definitions and unclear rules due to plagiarism. The moral concept of plagiarism is concerned with the unearned increment to the plagiarizing author's reputation that is achieved through false claims of authorship.

Self-plagiarism is the reuse of identical or nearly identical portions of one's own published work without acknowledging that one is doing so or without citing the original work. Articles of this nature are often referred to as duplicate or multiple publications. This is illegal, if copyright of the prior work has been transferred to another entity. In academics, self-plagiarism occurs when an author reuses portions of his own published and copyrighted work in subsequent publications, without citing the previous work^[17]. Free online tools are now available to identify plagiarism^[18, 19]. Range of approaches are now there that could attempt to limit online copying of materials, such as disabling right clicking and placing warning banners regarding copyrights on web pages. Instances of plagiarism that involve copyright violation may be addressed by the rightful content owners by sending a digital millennium copyright act (DMCA) removal notice to the offending site-owner or to the internet service provider (ISP) that is hosting the offending site.

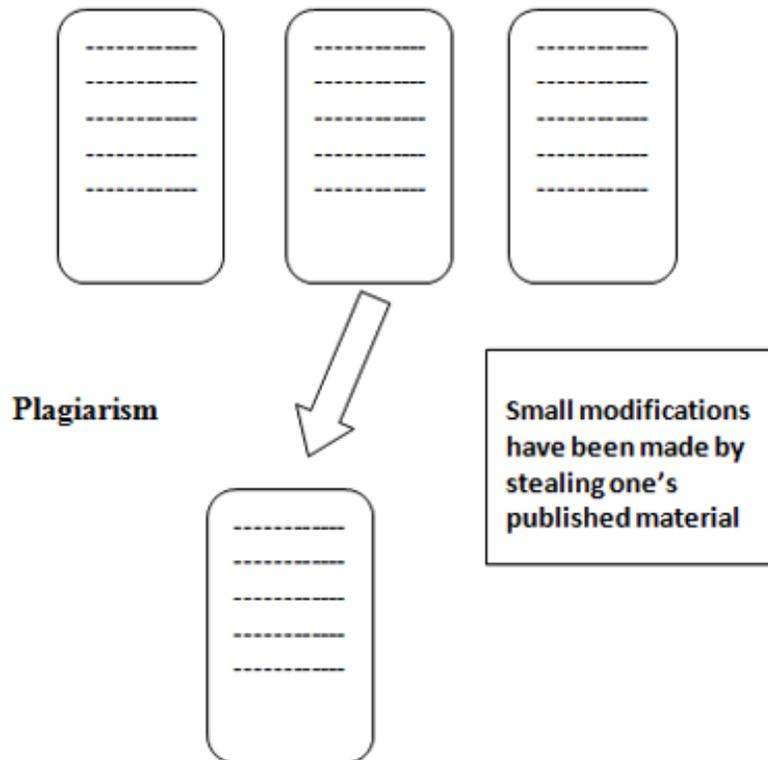


Fig 2: Academic plagiarism.

8. Research ethics

Research ethics involves the application of fundamental ethical principles to a variety of research topics or issues. These includes the design and implementation of research involving animal experimentation, various aspects of academic scandal, including scientific misconduct (such as fraud, fabrication of data and plagiarism), whistle blowing, regulation of research etc. There are many ethical issues to be taken into consideration for successful research. Scientists as well as sociologists need to take care of the responsibilities to secure the actual permission and interests of all those involved in the research activities. However, there is a growing recognition that these formal measures are insufficient and do not necessarily warrant a research process 'ethical'. People engaged with research should not, therefore, be solely depend on the dominant and de-contextualised understandings of ethics, but should negotiate reflexively through dialogue with other researchers as a way to bridge global and local understandings of research ethics ^[20].

9. Conclusion

The present article is helpful in order to train the young learners in the field of research. Researchers should not misuse any of the research information so far discovered and published so that moral responsibility can be maintained towards the new-born researchers to develop an ideal research strategy in future for the welfare of mankind.

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