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Introduction to Research, Sub-Breaking and Ethics: The First Knowledge Before Starting the Research Empire

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Abstract: Research and ethics are two words that will always link together. A good management is required to conduct a good research and a good research is the one that is highly-ethical. This study discusses the three types of research known are basic research, applied research and action research. There are several criteria that need to be met in order to come up with a high quality research which include the scientific quality and the scope to name a few. Ethical issues commonly encountered in research and how to achieve a high-impact result with little resource by implementing MDA (Multi-dimensional Assessment) in the research are also addressed here.

Key words: MDA, management, scope, highly-ethical, basic research, resource, Malaysia

INTRODUCTION

The main reason for a research to be executed is to identify the problem or the answer to an uncertainty whether it was in the past, present or future. Research also acts as a solution to a problem. Every human being has problems and has faced them and that is the purpose of the human brain which is to distinguish between good and bad. Through the power of mind, human can extract problems, formulate strategy and solve them. Thus, everyone has actually done research in their lives, no matter the level of their positions. Research is an activity that has an impact on theory which role is to express and explain a phenomenon. The result is that knowledge of a new research could confirm or reject existing theories.

It is therefore, important to realize the management and ethics involved in executing research where living in the internet era has enabled researchers to obtain information and collect data easily which sometimes could cross the boundaries of privacy and ethical issues (Ignatova and Brinkman, 2007).

Dispute in research, management has a great impact on the outcome and could also lead to the resignation of members in the group due to dissatisfaction (Green and Costello, 2009). Innovation which is very important in a high quality research is the process or result of the development of knowledge, skills and experience to create or improve products, processes or new systems that provide significant value to the socio-economic communities and countries.

Research classification: In general, research can be classified into two parts based on the purpose and the method. The purpose of showing the results obtained at the end of the research methods which would refer to the means used is to achieve the objectives of an investigation. There are three types of research which are basic research, applied research and action research.

Basic research (knowledge discovery): Basic research or fundamental research is more to the discovery of knowledge alone; it can also be defined as research carried out in one continuous period and did not produce benefits in the short term. It encourages exploration of the idea/concept/theory as a catalyst for new discoveries, knowledge development and creation of innovative and modern. Basic research is fundamental to be a continuation of other research that is applied research. Matters conducted under the basic research are as follows:

- Research that focuses on the theories that exist in the field of education with greater depth such as nervous tension theory by psychologists

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- Research that encourages exploration of the idea/concept/theory/as a catalyst for new discoveries, knowledge development and creation of innovative and decoration
- Research to obtain empirical data that can be used to develop and evaluate theories
- Research in form of experiments and theory to obtain new knowledge to explain the phenomenon and research the facts without specific applications or use
- Basic research in continuous periods of time will eventually contribute to the research is applied and then produce products that can be commercialized

Applied research: Applied research is defined as original research undertaken to acquire new knowledge based on a theoretical basis for achieving goals and objectives for a specific use or to review the new application methods in practical use of the existing use knowledge to obtain through basic research. It aims to solve practical problems faced or to test a theory to evaluate its application in a field. It also aims to find the best things to run and whether the data provided to support a theory, a theory of change or development of a theory.

Research is part of the development of applied research. It relates to the development of effective products for use as the development of design guidelines, materials testing and management systems.

Basic research: Review of the factors causing delay turn on for a laser. Results indicate that the temperature and the external feedback is the main factor causing the delay this time.

Applied research: Developing a system that can turn off and turn the laser on the remote control, especially the recipient.

Action research: Action research related to resolving a problem at a place and carried out by investigators in which he would use the reflection method of research to design and apply solutions. In other words, action research involves the study of the problems that led to a situation. The participation of individuals involved is also related to the implementation of its findings and seeks to solve a particular problem.

Research based on the method of classification: Research methods are characterized by the techniques used in data collection and analysis. Based on research methods, there are five types of research such as historical, descriptive, correlation and Ex-post facto experiment.

History research: The purpose of historical research is to draw conclusions related to the patterns, causes or effects of past events. It can be used to explain current events and predicting events to come. The collection of data is from original documents or interviews with witnesses of the original information. Data can also be obtained from secondary resources.

Descriptive research: Research is concerned with collecting data and testing hypotheses or answering questions related to the current state of a subject/matter under review. Research description also describes the situation in detail and describes the processes that occur. Descriptive research can be conducted either by asking questions related to individuals through questionnaires and reviews for example:

- Factors to be adopted by the lecturer as a catalyst
- Personal profile of teaching staff
- Analysis of building technicians
- The view of students on studies at college and so forth

Correlation studies: Correlational study aimed to determine the extent of the relationship between two or more variables that can be given value for example:

- The relationship between the grades of students at the high school level with their performance in technical institutions

This type of study not only reflects the situation in a particular situation but also to determine the reasons that lead to the emergence of the phenomenon under study.

Experimental research: The main features of experimental research are to manipulate at least one variable and controlling other relevant variables to determine the effects of one or more variables. The manipulated variables are independent variables. Research experiments often have ≥ 2 groups for comparison of variables. Type of research is to form a reasonable relationship reasons.

Ex-post facto review (after fact): This type of research concerning the impact and the reason is known but rather studied by researchers. Kerlinger defines research Ex-post facto:

The system of empirical research in which scientists have no direct control of independent variables as manifestations have already occurred because it works subtly and not manipulated. Thus, the researchers did not have control over these variables or he cannot manipulate variables

SYSTEMATIC RESEARCH PROCEDURES

A systematic research procedure is a guideline to enable researchers to conduct research with a more regular basis. Figure 1 shows the steps taken to carry out research and easily get the desired results.

Research criteria: There are some of the criteria to determine the quality of the final report of the research as:

Scientific quality: Research conducted in various fields (multi-discplinary) is required to be proven scientifically, the approach should be logical and appropriate and the relationship between the research, research-related issues and methodology is consistent.

A clear scope: All the key elements used in the research is clear so that the scope of the research will be more accurate (the field, theories, models, methods, analysis and interpretation).

Logical/expected outcome: Long-term effects associated with the social, health, safety, economic and technical areas must be considered and identified as well as the effects are not expected.

Operations: There is evidence that should be considered carefully in terms of approaches used in research, research strategies designed to take into account all factors including the reasons given in connection with the options taken.

Implementation: The process of research is appropriate in terms of time frame provided, the type and amount of resources used and the level of training/research experience.

Revision: Appropriate planning schedules, records and analysis of processes and activities should be available for review in the relevant field of research.

Documentation and publications: Completed research should be systematically documented. The data obtained

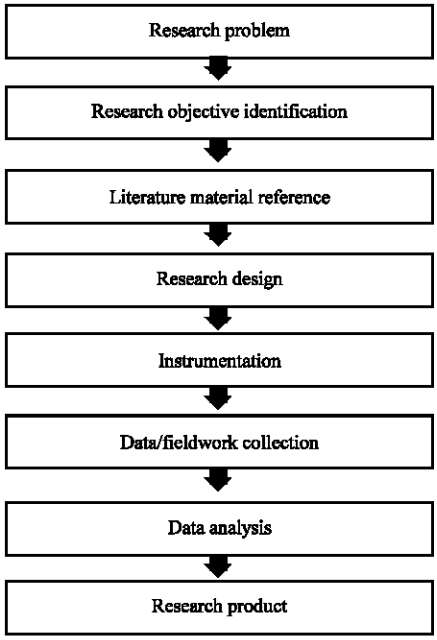

Fig. 1: Research procedures

should be stored and ready to be reviewed and published through the writing of books, journals or proceedings and presentations in a report.

ETHICS IN RESEARCH

Ethical issues are very important because they act as a guide to complete each study. Research that does not comply with the ethical reputation of an investigation can be damaging to both the reputation of the institution and the researchers involved. This is true especially in this internet era where information obtained from it is not clearly defined whether it is for public or private (Bos *et al*., 2009). Now-a-days, many ethics concerns are regarding the application of knowledge-reuse databases and reutilizing data and field notes in online environments (Buchanan and Ess, 2009).

This also includes information obtained through online communication where identity, language, consent and confidentiality are major issues that need to be looked into carefully (Capurro and Pingel, 2002). Dishonesty behaviours in conducting research such as fraudulence, falsification, plagiarism, delinquency and unauthorized help have become serious issues with the widespread usage of internet among academics (Karim *et al*., 2009). Although, internet has both exciting and concerning effects, it is unarguable that internet provides an excellent source of data and easy to access, however these convenience often lead to researchers forgetting that there are actually other human beings on the other

Table 1: Research ethic components and the description

Research ethics	Description
Value	Be faithful on certain moral values either before, during or after research is being performed
Self awareness	Aware of prohibited behaviour and self-responsibility on respondents
Profesionallisme	Planning and practicing research methods that will not have negative impact on respondents
Reliability	Not manipulating any data/result and writing an honest and truthful report
Disciplinary guide	Abiding by the rules of research which proclaim that unethical researcher will obtain unsatisfactory and invalid result
Language	Information is complete and the language used is easy to understand. Detailed explanation is also important to ensure that respondents will fully understand the question given by researchers
Respondent's feelings	Providing sufficient time for the respondents to answer comfortably and avoid asking inappropriate questions that might embarrass and cause emotional disturbance to them. In general, researchers cannot expose respondents to mental and physical stress
Ethics on research level	Researchers should be concerned about ethical election issues survey and have to determine the research methods, data collection, analysis, interpretation and also to report the research
Knowing the level of repondents' education	Taking into account the level education of selected respondents. Cannot assign improper and elaborated tasks to the respondents. This situation will complicate the process of case investigation and will bring a negative reaction from the respondents
Being frank with the respondents	Giving explanation to respondents about the goals and objectives of the study. All information should be discussed including the procedures involved in the study. This, the respondents will voluntarily participate in the study
Honesty (addressing the accurate data)	Researchers should be honest in recording, reporting and analyzing data. Although the data obtained through simultaneous or calculations are not in accordance with the data obtained by the experiments, these data can not be changed to improve results. Some of misconducts in research are providing incomplete and irrelevant data, falsifying discovery and providing misleading facts

Table 2: The proposed project is approved and the grant allocation for the initial and pre-commercialization

Project	1	2		3
Project Title	Optical cross add and Drop Multiplexer (OXADM)	WDM-POF for small world communication		Survivable FTTH Network
Spin-off		Development of intelligent Fiber-to-the-Home (i-FTTH) for Customer Access Network	Development of in-line monitoring optical device and centralized troubleshooting system for new FTTH network	
Financial support	Fundamental Research Grant Scheme (FRGS)	Research University Grant	Science -fund Grant	Pre-commercialization Grant
Research category	Fundamental	Applied	Applied	Innovation
Volume	USD ???	USD ???	USD ???	USD ???
Total	USD ???			

side of the information (White, 2002). Ethical behavior shoud be given serious attention in all areas in order to come up with a genuine and high qualilty result. For example in social science which involves a lot of research on human beings they give significant values on experimented subjects. Table 1 shows the research ethic components and their description.

Strategy outcomes: Determination of the research project must be prudent in reducing energy but with high impact. It could be achieved by implementing the MDA (Multi-dimensional Assessment) on a project. Through MDA (Multi-Dimensional Assessment), a certain project could be split into several other projects. By using this approach, the achieving of one objective could help them to solve other projects under it simultaneously under one shoot.

For example, the main the research is to develop high capacity and protection for customer access network. Using the MDA (Multi-dimensional Assessment) technique, the idea of this project is separated into three parts and each project will apply its own research grants. The knowledge of research type is very important to divide the project into several different sub-project/research. Bear in mind, all three projects have a primary objective of developing a high-capacity and protection system for consumers. Solutions to the key objectives will lead to solutions of the three projects under it (Fig. 2).

Project 1: Optical cross Add and Drop Multiplexer (OXADM)

Project 2: WDM-POF for small world communication

Project 3: Survivable FTTH network

Before constructing the research proposal, it is important to determine the type of research that is to be carried out. More importantly is the grant that is to be applied for. In Malaysia, there are several research grants offered by government and private sections. Among them are the FRGS, ERGS, LRGS, PRGS, Science-fund, Techno-fund, Agridana, ESSO, MTSF, university grants

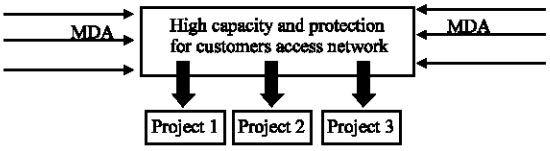

Fig. 2: MDA technique is used in solving the main project into several sub-projects to ensure that other projects run smoothly

and others. Table 2 shows the proposed project the research grants are successfully applied for research grants that had been. Besides splitting the project into two different sub-projects could help improve the financial assistance in carrying out these projects. From the total proposed projects, only project 1 and 2 have been provided a research grant.

However, project 3 is still running and is being financed by other provisions. The results obtained are used to apply for other grants such as pre-commercialization or innovation.

Creativity is very important in research management by enlarging the research scope and at the same time can apply many research fund under one key research. Instead of creativity, knowledge and high effort are the key element to excel in research and producing more benefits and outcomes for social economy development in Malaysia. Ethical issues are very important because they act as a guide to complete the research. Research that does not comply with the ethical reputation of an investigation can be damaging.

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