LEARNING RESEARCH METHODOLOGY – LEARNING BY DOING
A PRACTICAL EXPERIENCE

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Abstract

This paper describes the subject of research methodology based on the author's experience. Most students have very weak skills related to empirical research. Therefore, this paper intends to provide a practical way or method of learning research methodology for undergraduate programs. This practical learning method provides knowledge and experience on how to conduct a simple research. Learning begins with giving theoretical concepts, discussing examples of publication of research results, practicing simple research (starting from preparing proposals to writing research reports).

Introduction

Research methodology is seen as a difficult subject to be taught (Allen & Baughman, 2016) and students are very weak in understanding the research concepts (Murtonen, 2015). There are various objectives of learning research methodology that are targeted by institutions, departments, or study programs. Some emphasize on multidisciplinary learning, some emphasize on learning various software tools in data processing and analysis, and some focus on epistemology and the need to understand the role of scientific knowledge. Although the emphasis on learning research methodology can be different, Ciarocco, et al., 2017 explains that there is a consensus that students' achievement in conducting research is the most important of the whole process of learning research methodology. This paper will present a study of research methodology which aims to make students understand the theory and concepts of research and are able to conduct a simple research. In particular, it equips students with scientific research processes that uphold research ethics, starting from the process of identifying problems, developing a framework, designing research, collecting and analyzing data and compiling research reports.

To achieve this goal, practical methods with a simple delivery will be used, that can encourage students to conduct research on topics of their interest. Learning encourages students to ask research questions; study how previous researchers have addressed a problem; collecting data; and learn how to interpret statistical output. After this concept is presented to students, the next task is to improve the students' understanding, which is the task of making simple research.

Discussion

The following is an outline of practical ways that can be conducted throughout one semester of learning with the output of a simple research.

Part 1.

Providing The Understanding of Scientific Research Knowledge

Learning begins by asking questions that can encourage students to gain initial knowledge about scientific research. Questions like, “When did you hear the research term? What do students know about research? Who will conduct the research? What drives the individuals to do the research? After getting a lot of discussion about the answers to these questions, students will understand that research is not a statistical exercise, not a book summary or notes packaged in the format of a final project, not a book review, not a popular article for newspaper consumption and not a self-exploration on the problem which has never been learned before in college. Students are brought to the understanding that higher education is a scientific society and the research to be learned is scientific research using the scientific method.

Furthermore, the learning will be focusing on research issues and the motivation in conducting the research. Every research begins with an issue and motivation. Students are brought to the understanding that every individual has a basic need, which are being curious and find out about 'something' or things that attract attention. Things that draw attention are facts. These facts will attract our attention if we pay attention through what is read, heard, seen and felt through the five senses. Attention to facts presents a disturbance of mind, because what is hoped / desired is different from reality. This gap raises the question “Why”, and this is the “Research Problem”. This research problem needs to be answered by using human knowledge.

An example is given to students to understand the research issues and motivations. For example, in the national news, it was reported that Indonesian fishermen are still living below the poverty line. Individuals who pay attention to this fact are disturbed because this fact is not in accordance with expectations. Fishermen who backboned all the catches and fulfill basic human needs, how can they still live below the poverty line. The question of "Why" arises?

Task Part 1.

Creating Research Questions & Finding Issues, Motivations, Contributions and Goals in Published Articles

The main question is "Why is the life of fishermen still below the poverty line?". Research is certainly difficult to answer questions that are still broad and global. Students are directed to reduce to several problematic questions and can be answered through a research. Students in groups are asked to make two problematic questions, which are also the objectives of the research. Problematic questions can be viewed in terms of prices, distribution channels, income and others. For example: What is the average monthly income of the fishermen located in X Beach? What is the distribution channel for the fishermen's catch on X Beach? What is the percentage of difference in price from the fishermen to other parties to the final consumer? The results of this study can certainly provide a practical contribution to policy makers related to distribution channels and price policies.

Another example, a sales manager observed the sales realization report during the recent years and found that the realization was below the set target. This raises questions because throughout the year, there were many discount policies which have been given to the consumers. The management has asked to increase sales volume, and encouraged the research of "factors causing unfavorable sales gaps".

The next example, there is a problem of observing the fact that the amount of tax revenue does not match the increase of business and industrial world. This issue raises the question "Why", which then needs to be reduced to several problematic questions.

Furthermore, students are directed to learn the introduction of two articles published by lecturers, and students are asked to explain the parts that become the research issues, research motivation, objectives and research contributions. After studying the examples from the given articles, students are given assignments at home, which is to look for two research articles that attract them and mark which part of the article describes the issues, motivations, objectives, and contributions of the research. At the end of the class, students are reminded to prepare a simple research that will be conducted after the mid semester, by starting to pay attention to the facts (their area of interest) in order to find problems and develop research questions which are to be answered.

Part 2.

Seeking Temporary Answers for Research Questions

In the first part, students have gained an understanding of the issues, motivations, objectives, and contributions of the research. Furthermore, in this section, students are introduced to the terms such as construct (a more abstract concept), concept (observed phenomena that are still abstract), and variables (proxies of constructs that are measured to provide a more realistic overview of the research phenomenon). For example, the construct for job satisfaction. Job satisfaction can be broken down into several dimensions which at the same time can be the variables, such as job satisfaction; satisfaction with superiors; satisfaction with promotion. For example, satisfaction with promotion is broken down into a more concrete concept, for example related to opportunity, policy, openness, fairness, limitations, and others.

After the introduction of constructs, concepts, and variables, students are given examples on how to build a theoretical framework, which is built through reasoning that connects the association between variables that are of concern to the researchers. Reasoning that connects between variables is needed to build a theoretical framework that provides temporary / tentative answers to research questions. This temporary answer then becomes the problematic or presumption questions that will be tested later (hypothesis). Students will learn through examples of published articles, and highlight the sections of the theoretical framework. This section is also an opportunity to inform students regarding valid and legitimate reference sources, namely reputable articles published by reputable publishers. Use of Wikipedia, the popular online website is discouraged.

Task Part 2.

The lecturer shows the theoretical framework and hypothesis development section of the two published articles by lecturers, and then students are given assignments at home, which are to study the theoretical framework section of the two articles that interest the students and marking which part of the articles that explains the theory and hypothesis development. At the end of the class, students are reminded of the task of making simple research, finding issues, motivations, goals,

research contributions, and starting to collect theories and research results related to the variables which will be researched. The purpose of this assignment is for students to get used to digging up information on research results from various reputable sources. Students will experience the learning on how to explore existing knowledge, derived from the results of previous research or existing literature and combine it with the results of reasoning from researchers.

Part 3. Designing Research

In this section, students are given an explanation of how to design the research to ensure that the research will go as planned. Research objectives, research setting, time horizon, unit of analysis, and construct measurement are important things in designing a research. Providing many examples is the key to understand each element of the research design. For instance, an example of a descriptive study “an editor conducts a survey on readers, to explain the characteristics of readers”, an example of an exploratory study, “a manager digs up information to understand the characteristics of a phenomenon regarding cultural, religious, political values, and other aspects that form ethical values of workers” and so on.

Regarding the research setting, students are given various examples in order to be able to clearly differentiate whether the research is conducted in a natural environment or an artificial environment. An example of a field study is “analyzing the relationship between screening examination scores and the 1st semester students' grade-point”. An example of a field experiment is "analyzing the relationship between teaching methods and students' academic achievement". An example of a laboratory experiment "analyzing a causal relationship between interest rates and savings through experiments using an artificial environment".

About the units of analysis. Students are given examples to understand the differences between individual, group, or organizational units of analysis and to differentiate the units of analysis of companies, industries, and countries. For example, research on employees' behavior. If the unit of analysis is individual, then what is being observed is the behavior of individual employee; if the unit of analysis is group, then what is being observed is the behavior of employees in a group (addition or aggregation of data on individual employees in one group is performed); if the unit of analysis is organizational, then the focus will be on organizational behavior (addition of all individual data on employees who are members of the organization). Another example, capital market research related to stock prices. If the unit of analysis is the company, the research focuses on the stock of one company; If the unit of analysis is the company, the research focuses on the stock price of companies in one industry (the stock price of all companies listed on the stock exchange) and if the unit of analysis is the country, then the research is on the culture.

The time horizon is also an important research design issue. Students are given several examples in order to be able to differentiate between a single-stage study (a study in which data collection is conducted at once), a cross-sectional study (a one-stage study in which data is in the form of several subjects at a certain time), a time series study (a study that emphasizes research data in the form of time span data), and multiple-stage (long-term) studies. For example, the researcher collects data to examine consumer preferences towards a number of product brands and data collection is conducted all at once through a survey, after that, the researcher does not conduct another survey on the same respondents (one-stage study). Comparative study on the profitability of five companies in a certain year (Cross sectional study - a one-stage study in which data are several subjects at a certain time). Research on the development of a company's sales during the period 2010-2020 (a time series study that emphasizes research data in the form of time span data). Researchers want to know & explain how the role of accounting in shaping the company's culture in where accounting is practiced (Long-term study, in which researchers conduct intensive observations of accounting practices/reality in certain companies in a relatively long period of time).

The research design also includes planning related to the construct measurement. Construct measurement involves measuring scales or the use of attitude measurement methods. Various measurement scales such as nominal scale, ordinal scale, interval scale, and ratio scale are introduced to students. Likewise, the attitude measurement methods include a simple scale, a category scale, a Likert scale, a semantic difference scale, a numerical scale, and a graphic scale.

Task Part 3.

The lecturer shows the research design from two articles published by the lecturer, and then students are given assignments at home, which are to study the research design of the two articles that interest the students and marking which part of the articles explains the research objectives, research setting, time horizon, unit of analysis, and construct measurement. At the end of the class, students are reminded again of the task of making a simple research, such as finding issues, motivations, goals, research contributions, starting to collect theories and research results related to the research variables, as well as designing research.

Part 4.

Sample Selection and Data Collection

Sample selection and data collection are difficult and challenging parts for students. Students are introduced to various sources of data (primary data and secondary data), methods of selecting probability and non-probability samples, as well as various methods of data collection (interviews, questionnaires and observation). Discussions about samples and data collection methods are conducted through examples. For instance, students are asked to identify a sample and choose the most appropriate data collection method and provide an argument for the following situation “A pharmaceutical company in West Java wants to get the opinion of the population regarding the plan of implementing the constitution law that allows advertising of drugs that can only be purchased with doctor's prescription"; "Personnel management policies for warehouse employees at wholesale companies in the west of Indonesia". The purpose of this section is to educate the students about the vast archive of available raw data, how to obtain data (conduct data collection) and how data is processed with statistical tools. Students are also invited to see examples of research questionnaires and learn to design questionnaire questions.

Task Part 4

The lecturer explains the sample and data collection methods from two published articles, and then students are given assignments at home, which are to study the sample section and data collection methods from two articles that interest the students and marking which part of the articles describes the sample, population, sample selection methods, and data collection methods. At the end of the class, students are reminded again of the task of making simple research, such as finding issues, motivations, goals, research contributions, starting to collect theories and research results related to the research variables, designing research and determining samples and data collection methods.

Part 5.

Data Quality Analysis and Hypothesis Testing

In this part, students are introduced to the quality of research data. The quality of the data includes the validity and reliability of the data. Students are taught how to read the results of validity testing, data reliability, descriptive statistical test results, and how to read the results of hypothesis testing. Students are also shown how to analyze data, read the output, and how to create a narrative from the results of the processed statistical output.

Task Part 5

The lecturer will show the results of the validity, reliability and hypothesis test results from the two published articles, and then students are given assignments, which are to study the data testing section of the two articles that interest the students and marking which part of the articles explains the data validity, data reliability, the results of descriptive statistical tests, and the results of hypothesis testing.

Task Part 6

Each student is assigned to conduct a simple research with a free topic. Starting from writing proposals (containing introduction, theory & hypothesis development, designing research, preparing questionnaires), presenting proposals to get feedbacks, collecting data, and making research reports. At the end of the class, students are also asked to present the results of their research, discuss the limitations of their research, and explain the contributions and implications of their research.

Conclusion

The learning of research methodology with a “learning by doing” approach is very useful for students. This approach encourages students' participation in the entire research process. From developing research questions to collecting, analyzing data, and making conclusions from empirical evidence. Research topics that are customized with the interest will promote creativity and a deeper understanding of the research process. This method also provides an opportunity for lecturers to integrate research into learning (teaching). Providing opportunities for students to be experienced in conducting research also gives hope to students to be prepared for their future jobs (Murtonen et al., 2008).

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