

Research Methodology Course for Undergraduate Students in Indonesian Tertiary Education



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ABSTRACT: Undergraduate students in Indonesia, including those pursuing bachelor's degrees and diploma programs that may last three or four years, must take a research methodology course. Despite their lack of desire to become researchers, they must complete a final project that necessitates research skills. Students who complete the Course in one semester learn how to write a proposal, collect data, analyze data, and perform other tasks that a professional researcher would typically perform. Some lecturers who teach research methodology course in various study programs were interviewed. The present research uncovers how research methodology courses were presented and implemented. A variety of implementations were found, but most of them apply the use of assignments as an alternative to the learning by doing approach. A different number of credit points were also found in different study programs, impacting the number of sessions the students must spend. The methodology course comes in different nomenclatures in different study programs. They share a common goal: to help students conduct a final assignment as a requirement to graduate from their educational institution. Some suggestions on how to improve the Course are also expressed.

KEYWORDS: undergraduate; research course; study programs; final project

I. INTRODUCTION

The research methodology course appears to be beneficial for completing their final assignments and their future lives. In the D3 program, the final project is called tugas akhir (TA) in Indonesia or translated as the final assignment. In D4 or bachelor's degree it is called skripsi but in master's and PhD degree, it is called theses.

Besides conducting research, learning research methodology may teach the students life skills which are useful for the student's future. There are aspects of the scientific method, critical thinking, and other aspects that are useful in students' lives. Acquiring new knowledge is known as research besides through reading and experiences. Research also can even accelerate the process of finding new knowledge!

In the Code of Federal Regulations ORI (2019) relating to the protection of human subjects, research is defined as "a systematic investigation (that is, the collection and analysis of information) designed to develop or contribute to generalizable knowledge." Furthermore, according to the National Academy of Sciences (1995), the research aims to go beyond what is already known about the physical, biological, or social world. Unlike other methods of acquiring knowledge (such as reading a book), research employs a systematic process known as the Scientific Method.

Research methodology refers to the practice of "how" each research piece is carried out. This research method is concerned with how a researcher designs a study in such a way that the results are valid and reliable while also addressing the research aims and objectives. (Jansen & Warren, 2020)

The subject of Research Methods covers a wide range of material topics that must be tailored to the study program in which the subject is taught. The research Methods subject is very consistent with the other subjects in the Study Program and has a massive role in the career during their study and after graduation and helps students do their Final Project when they want to complete their studies.

The ability or knowledge of research is one of the provisions for students to become critical individuals capable of thinking logically and systematically. Students and graduates should be able to distinguish between opinions and facts and which theories and natural laws are true and which are false. Students will benefit from research techniques and their application to real-world issues (Braguglia, & Jackson, 2012).

The research elements are factors that must be present in a study. Nunan (1995) believes that three major factors contribute to the occurrence of a study: questions or problems, data, and analysis. Another scholar named Crouch (2020), believes that there is another component that distinguishes this research as scientific research, namely publication. Publication is first in the form of report, then it can be in a journal or other type of publication.

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Taking an introductory research methods course is a must for undergraduate students who may need to conduct original research in the future. These courses are also important for students who do not intend to conduct research, as graduates must make informed decisions about research findings as part of their professional development (Zablotsky, 2001). Study methods courses are difficult to teach because the course material is technically complex. This is due to the technical difficulty of the course material, despite the fact that student interest in the material is sadly low. The majority of current linguistics research methods texts cover both qualitative (e.g., discourse analysis and ethnography) and quantitative (e.g., questionnaire surveys) methodologies.

According to Groessler (2017), the following guidelines for teaching research methods and practices should be followed:

1. Make research visible by connecting learners to research through active learning.
2. Allow students to learn by doing: Immerse students in real-world research to make research learning more authentic.
3. Promote self-reflective learning about the research process by implementing the following strategies: Students and educators should be encouraged to concentrate on the research process in order to understand their role in the larger picture.

According to Ball and Pelco (2006), teaching research methods by requiring undergraduate students to participate in group-based research projects over the course of a semester is an excellent way to teach research methodology. Students adapt well to the challenges posed by such a class format because it combines recent pedagogical and technological developments.

Similarly, Lundahl (2008) recommends using active learning techniques when teaching research methods and provides some practical guidance on how to do so. (Saeed et al. 2020) recommend incorporating research proposal writing into the research method course. According to the report, students saw research proposal writing as a positive experience that allowed them to focus on research method learning and become acquainted with and interested in research. The findings have pedagogical implications in the sense that assigning research proposal writing to postgraduates is beneficial for teaching and learning research method courses, particularly when accompanied by teacher support and guidance (2020).

Braguglia and Jackson (2012) developed three courses to develop research expertise: statistics, research methodology, and organizational behavior. Because of the integration, students improved, strengthened, and refined their research skills.

In another case, Gunn (2017) adds a twist to several problem-based approaches by motivating students to think comparatively by incorporating a comparative research project that asks different student groups to use different methods to solve the same problem: the inclusion of a comparative research project that asks different student groups to use different methods to solve the same problem. Faculty members are frequently involved in this. This is similar to what Aguado (2009) proposed in using "learning by doing" in teaching research methods. The learning by doing is also implemented by using teaching assistants in research methodology. (McKeegan, 1998)

Knipe, Miles & Bottrell (2018) used a Journal Article Research Analysis (JARA) Schedule to enrol students in a research methodology topic as part of a graduate entry initial teacher education program. He discovered that it was a valuable tool for assisting students in understanding the principal research domains. This is a tool and resource that academics can use to help students learn more effectively in research methods classes.

Although there is not a lot of study on methodology courses, there are a few studies that look into undergraduate research. Mabrouk & Peters (2000) investigated the students' perspectives on undergraduate research. They found some difficulties in conducting research. Difficulties were identified as a result of 1) differences in faculty and student perceptions of the required time commitment; 2) difficulties students have prioritizing competing demands of classes, work, the lab, and life in general; 3) insufficient support emotional, advisory, etc.) from the research advisor; 4) self-motivation; and 5) student fear of failure.

The research findings done by Fechheimer, Webber, & Kleiber (2011) demonstrate that participating in research for more than one semester is associated with a higher GPA. While Lopatto (2007) suggests that undergraduate research improves the educational experience of science undergraduates and attracts and retains talented individuals interested in science professions. This is similar to what Hunte, Laursen, & Seymour (2007) in their research on investigating the role of undergraduate research.

Madan and Teitge (2013) go into great detail about the advantages of undergraduate research. Undergraduate research experience, they discover, helps students better understand published works, balance collaborative and individual effort, identify a research field of interest, and get a head start on their careers as researchers. Many students discover their interest in research as undergraduates and go on to graduate school and faculty positions as a result of their research exposure.

However, some studies analyze and investigate graduate or research methods courses in the master level (Lei, 2008; Onwuegbuzie, Collins, & Jiao, 2009; Tungprapa, 2015; and Witcher, Alexander, Onwuegbuzie, Collins, & Witcher, 2007). The current study investigates how the methodology course is taught in some tertiary education study programs in the undergraduate level in Indonesia. The following questions are set.

- What are the objectives of the research methodology course in undergraduate classes?
- How are research methodology courses conducted?
- What materials are given in the research methodology course?

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Research on methodology course and how it is implemented has never been done by any scholar. So, the present research will contribute to knowledge about research methodologies especially in Indonesian undergraduates. However, as can be seen from the literature review above, there some that discusses how to teach methodology course.

METHODOLOGY

To answer the questions above, 18 lecturers who teach the research methodology subject in different study programs were given a questionnaire that generally includes open questions about the contents and implementation of the research method course. Most lecturers have taught the subject for quite a long time, and they taught in undergraduate classes such as in Diploma 3 and Diploma 4, also known as Sarjana or Bachelors' degree programs. Those who are assigned to teach research method subjects have a good track record and experience in research and publication. They are affiliated with polytechnics and universities. A great deal of valuable information in qualitative data was gathered and is now usefully presented here for further discussion.

The study programs which became the subjects under investigation consist of four Diploma 3 study programs and 7 D4 or bachelor's degree study programs. Three of the seven bachelor's study programs are from outside Polytechnics. Those are psychology, English and mechanical engineering programs. The D3 programs are English, accounting, business administration, and electro engineering.

The questions were written in the Indonesian language, and the answers were also in Indonesian. The comments as written in this article have been translated into English. The answers to the questions were grouped according to the categories of the names, aims, contents, implementation, significances, and hindrances. Then, the data were analysed further to answer the research questions.

RESULT

The subjects' names are various, although they are still in the domain of research methodology. In many study programs, the subject is called 'research methodology' or just 'research'. In the English study program, the name of the subject is 'Basic language Research Methodology' as it teaches the basic principles, skills, and knowledge of research methodology. In other study programs as in Marketing management and psychology, the subject is called Qualitative Research, as it focuses on the use of qualitative methodology to conduct their research. In addition, there is also a course called Quantitative Methodology in the same university, which assigns the students to conduct quantitative research by the end of the course. This nomenclature shows and represents the course contents.

Regarding the credit points from this course, the number is various between 2 and 3. In a higher level as in D4 or bachelor's degree program, the credit points are three, but in lower level as in D3, most study programs set 2 credit points for this subject. As we are aware, the credit points have implications on the amount of teaching and learning and the students' weight in taking the course. In Indonesian polytechnic or vocational tertiary educations, the two credit points of subjects take four fifty-minute sessions, but in universities, the 2-credit points take only two fifty-minute sessions. While in ordinary tertiary educations such as university, one credit point is equivalent to on fifty-minute session of teaching and learning in class. At the same time, the three credit points in polytechnic may take between 5 to 7 fifty-minute sessions per week. The research method course in polytechnics then is filled with lots of activities to complete the requirements of their delivery course mode of 60% practice and 40% theory. The table below shows the number of credit points of the research method course in each study program under investigation with its corresponding number of sessions.

Table: Credit Points and Number of Sessions for Implementation of Research Method Course

No	Study Program	Nomenclature	Level	Credit Points	Number of Sessions
1	Accounting	Riset (Research)	D3	3	5
2	Business Admin	Riset Kualitatif (Qualitative Research)	D3	3	5
3	Electro	Metodologi Penelitian (Research Methodology)	D3	2	4
4	English Polytechnic)	Research Methodology	D3	3	5
5	Travel and Tourism	Penelitian Bisnis Pariwisata (Tourism Business Research)	D3	3	7
6	Asset Management	Riset (Research)	D4	3	5
7	Marketing management	Riset Kualitatif			
	(Qualitative Research)	D4	3	5	
8	Chemistry Engineering	Metodologi Penelitian (Research Methodology)	D4	2	5
9	Energy	Riset (Research)	D4	3	5
10	Electro	Metodologi Penelitian (Research Methodology)	D4	2	4
11	English (University)	Metodologi Riset (Research Methodology)	S1	2	2
12	Mechanical Engineering (University)	Metodologi Penelitian (Research Methodology)	S1	2	2

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13	Computer Engineering	Metodologi Penelitian (Research Methodology)	D4	3	5
14	Vocational School (university)	Riset (Research)	D4	2	2
15	Politeknik Elektronik	Metodologi Penelitian (Research Methodology)	D4	3	6
16	Politeknik Perkapalan	Metodologi Penelitian (Research Methodology)	D4	3	6
17	Psychology - University	Metode Penelitian Kualitatif (Qualitative Research Methodology)	S1	2	2
18	Psychology - university)	Quantitative Methodology	S1	3	3

There is a similarity in providing undergraduate students with a research method subject. All study programs shared a common goal: to provide students with the skills and knowledge needed to complete the final project as a prerequisite for passing the study program. The final project necessitates the skills and knowledge required to create a proposal, collect data, analyse it, and write a report, as is typically done by a researcher.

Regarding the question on how the research methods course is conducted, the answers are various. In polytechnics, the course is divided into theory and practicum. If the number of credits is 2, 1 is for theory, and the other one is for practicum. If the number of credits is 3, 2 of them will be practicum. This is intended to accommodate the implementation system learning and teaching in polytechnics and other vocational institutions that the practicum of a subject should be more than 50 %. The theory is given in a form of lecturing, while the practicum is implemented variously as in the form of presentations and other types of assignments. The assignments can be done individually or in groups. While in university, as can be found in the table above, the weight of the credit is two, and it is dedicated only to theory.

The same various things as to the answers to the question on what materials are given in research methodology course. As the name suggests, a few study programs call the course 'qualitative research'. This nomenclature shows the contents that the subject teaches, that is, all about qualitative research. While in other study programs, both qualitative and quantitative methodology is introduced to the students. Accordingly, the students can choose the approach they will take to conduct their research project. In other study programs, the lecturers raised the cases that they find in the fields that they may work on later. They may also be interviews or interview samples when they collect data for their research.

The lecturers also raise and compare the methodology used in the research that they have found in the articles that the students have been assigned to read. A few lecturers also focus on writing skills as they realize that writing is the most problematic that the students find when they conduct their final assignments. However, the materials commonly found in the methodology course are research proposals, writings of background and literature review, data analysis, and data collection. Those are the skills and knowledge that a professional researcher has to master when conducting research.

DISCUSSION

The research method course is indeed required to make students accomplish their final project. This is acknowledged by a lecturer who stated that the course has just been added in the last four years, having found that there were the students' difficulties in doing the final assignment due to the absence of the course. This is what he must state about the Research Method course

This course has only been taught for 4 years. But because students get obstacles to doing scientific writing, including making proposals and thesis, the idea to make this course appear.

However, the students must comply with an additional and recommended assignment at the end of the course in specific study programs. In the Travel and Tourism study program, the students are suggested to send proposals to be entered into a competition known as the Student Creativity Program, which is held annually by the institution and by the Directorate General of Higher Education. If they can do so, the students will automatically be granted with A score. In the Electro D4 study program, the students are recommended to participate in a national seminar held annually by the institution. The idea of using proposal in the research method course is suggested by Saeed et al (2020)

The Course contents are various, although they share a common thing: the courses are oriented to make students able to conduct the final assignment. Most of the study programs teach the basic theory on research methodologies such as different types of research methods and different modes in data collection and data analysis. In a higher level, as in bachelor's degree program of Asset management, students are also given statistical skills to make them able to analyze the data statistically. This leads to the similarity in the implementation of the teaching process. Most of the study programs give the students assignments and have them presented to their peers, which can be done in groups or individuals. These assignments are similar to the idea in involving students in research activities as suggested by Aguado (2009) using the learning by doing approach. Regarding the choice, whether it is a group or individual work, one of the lecturers has a good suggestion:

Why aren't individuals per group? Although there are slow students but can eventually make scientific work or be able to analyze texts. If the task is done per group, then according to experience that only the smart who do a lot of tasks that are ultimately weak, there is no progress. Although the slow late but the final result students can do their jobs well.

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While students of the social studies program can do research in any venue because of the methods of data collection involving mainly human beings, engineering students must do research in a lab. This is stated by one of the lecturers of engineering departments:

Students in this study program must research in the Lab. In the lab there is a complete SOP that students must follow. For the results of writing from research, first the method. From the method is found case or case study. This case must be solved by the new method or if another researcher uses the method, then find new things that have not been done to the method, for example, speed, density, efficiency, etc.

Finding a case or case study is comparable to what Gunn (2017) said about thinking comparatively by adding research projects to employ various ways to address difficulties.

Conducting research is associated with writing the report and publishing it as mentioned in the above comment. It is inevitable that to conduct research, we should have research skills as well as writing skills. This includes the writing of background, objective, aim, literature review, etc. All these writing sub-skills are taught and practiced during the course. The students are also required to present their primary assignments, which are proposal writing.

When asked about the hindrances in delivering the research course, many respondents did not reply. This indicates that there are no severe problems both in the teachers' and students' aspects. However, there are teachers who put forward the problems. One of them is related to the problem of the writing skill and another one to the economic condition of the students so they cannot possess a laptop. Two of the lecturers express their difficulty in conducting research in the pandemic condition, stating:

Data collection is usually through interviews observations. But because of Covid-19 all of that is hampered.

Finding the novelty of research may be hard for some people. Hence, one of the lecturers suggests looking at other people's works and discussing them in class. She stated:

Collect other people's works to learn similarities and see whether others have also written on similar topics. Also look for the tools they use. If the tools for research used are different, then similar topics can be done to find novelty. The method used must be explained to measure the results of an experiment.

Regarding the choice, whether it is individual or group, a lecturer suggests:

Why not individuals, not group? Although there are slow students, but they can eventually make scientific work or be able to analyse texts. If the task is done per group, then according to experience that only the smart who do a lot of tasks, but for the weak there is no progress. Although the slow do the task late the final result, the students can do their jobs well.

Encouraging students is a must. In the beginning, they may be shocked to see the assignment, but the role of the lecturer is to encourage until the students can conduct the assignment. This is what a lecturer has to say about it.

Before the lecture begins, individuals must read and understand the Course by looking for 20 journals, both national and international). Then students are asked to understand a literature review that is tailored to the field preferred by the student. To understand the literature review, students are directed to see the content of the journal, starting from the general nature then to the specific content.

Lecturers then comment on the results of student reviews by providing research knowledge.

Students were told to compare one journal to another, which is usually only seven closest or appropriate journals. Students were told to map which areas were the same and which were different from the journals reviewed. Then the students were told to find which areas have not been studied or which roles have not been worked from one journal to another.

The approach is like what Knipe, Miles & Bottrell (2018) have done who suggest using a Journal Article Research Analysis in their research course. There are various ways of solving the problems and making the students able to understand the lecture and conduct the assignments. Here the role of a lecturer as a facilitator, problem-solver, the educator is obvious. Even a slow learning student can finally make a satisfactory assignment if he is given attention and guidance.

The comments listed above are very useful for teachers who teach research methodology classes. They can inspire the teachers in conducting the classes and they may help solve the problem that they have found. There are some which focus on teaching research methodology for the purpose of making students able to conduct their final assignments. There are some which combine the teaching of research methodology with the teaching of writing which also have the same purpose on completing the students final assignments.

CONCLUSIONS

Research methodology course is given to all study programs in Indonesian tertiary education no matter what level they are. Polytechnic is a vocational school that has its own management and offers the research methodology course in their D3 to D4 or S1 level. Polytechnic is a school that applies the principle of 40% theory and 60% practices. That is how research methodology course is implemented. This is different from university which only applies 100% theory for this course as seen from the credit system given. Vocational school can also be found in an ordinary well-known university, and the implementation of credit points in a vocational school follows how it operates: one credit is equivalent to one teaching session.

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Vocational education in Polytechnics has obviously applied the 60% practical course in Research methodology classes as seen from the implementation of lessons on finding the topics for research (in this case for their final assignment) making a proposal, collecting data, and analysing data. These are conducted through learning by doing or by experience methods. The students have actually jumped into the field, not just learning the theory of those materials.

The nomenclatures for this course come various. Many study programs name the course as just research or research methodology, and others to name it more specific such as qualitative research method or primary language research methodology. The names indeed bear the contents.

The primary purpose of providing research methodology subjects to students is to make them able to do the final project, which is a requirement to graduate from the institution. This project is available in the final semester in each level of study. To conduct the final assignment, the students are required to possess research and adequate writing skill.

The contents of the course vary from one study program to another. However, most of them require students to conduct assignments such as writing proposals that can be used for the final project. This is supported by a number of learning sessions, especially in polytechnics, where the research method course should have at least one credit point for theory and one for practice. So polytechnic students should attend between 4 and 7 fifty-minute sessions per week for this course depending on the study program taken.

How the course is delivered also vary. This depends on the characteristics of the study program. Learning by doing is probably the most effective way of learning. Guidance from the lecturer plays a critical role in making the students conduct their final project as the ultimate aim of the research methodology course in the undergraduate course.

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