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Research Methods for Dissertations on the Architecture Doctoral Program

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Abstract. The output produced by a student at the high program level is a dissertation. This phenomenon is present in almost all universities at the undergraduate, graduate and postgraduate program level, which requires students to master the philosophy of science as a compulsory course. The foundation is to search for science using logic, epistemology, and methodology. Many research methods can be used in a dissertation, depending on the research topic and the concept of the research paradigm. With the literature study method, this paper aims to provide an overview of the research methods commonly used in dissertation, especially for architectural doctoral programs. The point of view includes understanding, the outline of philosophical thinking and concepts, writing goals and steps, and examples of architectural methods.

Keywords: research methods, dissertations, doctoral programs, architecture

1. Introduction

The depth of research results distinguishes research at the undergraduate, graduate, and postgraduate program levels. Research methods and data analysis techniques can be carried out similarly, but the interpretation results and core solutions to problems will differ according to the student's proficiency level.

This study discusses research methods commonly used in dissertations based on this phenomenon. Specific discussions are limited to architectural doctoral programs by delving deeper into various points of view. These viewpoints include the definition and outline of philosophical thoughts and concepts, writing goals and steps, and examples of using several standard research methods in architectural dissertations.

2. Literature

In general, the philosophy of science is a branch of philosophy that studies the characteristics of science and how to obtain it using logic, epistemology, and methodology. It explains the context of scientific discovery and justification.

Epistemology is used to examine the nature of knowledge based on its validity, structure, limits, and sources of knowledge. The validity system uses three truth theories: correspondence, coherence, and pragmatics. The correspondence theory of truth aligns ideas with external reality, resulting in empirical-inductive truth. Truth or circumstances are considered valid if there is correspondence between the meaning of a statement and the intended object of the statement [1]. Figures who pioneered the theory of correspondence truth include Aristotle, Plato, Ramsey, and Moore. The significance of this theory in science lies in the fact that it obtains a truth that everyone ever accepts. The theory of truth aligns logical propositions, resulting in deductive formal truth. Truth is formed by the relationship between judgments, not by the relationship between judgments and facts and reality. The figures who used this theory were Hegel and F.M. Bradley, who were idealists. The pragmatic

theory of truth harmonizes instrumental and usefulness, resulting in functional truth. A statement is considered valid if it has practical uses in human life [1].

Methodology is used to explain the steps in obtaining science. There are two commonly used research methods: qualitative and quantitative. The quantitative research method is considered a research method determined by the philosophy of positivism. Random is the sampling technique for this method [2]. The qualitative research method is based on the philosophy of post-positivism. It is an artistic method because the research process is more creative, and it is called the interpretive method because it is interpreted based on the findings of data in the field.

3. Methodology

This research uses a qualitative paradigm and briefly explains several dissertation research methods. It uses literature studies to describe several examples using specific research methods.

4. Results and Discussion

4.1. Phenomenology Method

Phenomenology comes from two Greek words, namely *Phainomenon* and *logos*, which means more or less the study of something that appears by itself. One must return to the topic in phenomenology to find the correct meaning [3]. Husserl's phenomenon 'aims to find the essential by allowing it to speak for itself without prejudice' [3]. Phenomenological research is a strong and earnest effort to discover a situation's truth and belief based on the results of observations on the reality of symptoms.

The outline of philosophical thinking of the phenomenological method can be seen from several types of phenomenology. The first is transcendental phenomenology, where, in understanding, everything seems to be considered for the first time. Existential phenomenology is where the most essential thing in the development of science is to understand consciousness and activity. The phenomenology of negativity understands stuff by making it thematic to the unconscious. Perception phenomenology looks at experience by prioritizing perception based on methods and language. Interruption phenomenology understands everything by rearranging the phenomenological method itself. The phenomenology of reality and the meaning of understanding everything begins with a continuous process of sensing and experience.

The purpose of the phenomenological method is to try to find the truth by understanding the essence of a phenomenon without having to know the cause by providing meaning. The first step is to ensure a suitable formulation of the problem. The next step is to give meaning to what is obtained, then carry out the data analysis process in various ways such as clustering, labeling, and coding, and the last stage is to provide an interpretation of the final results of the research.

An architectural journal that is an example in the discussion of this phenomenological method is "Kajian Fenomenologi Rose Window Pada Gereja Paroki Hati Kudus Yesus Malang" [4]. This research was written by Andrei Yusuf Ajie Wibowo and published in the journal Interior Dimensions in 2008.

This study aims to understand the meaning of the rose window above the front gate of the Gereja Paroki Hati Kudus Yesus Malang Malang. Phenomenology is a research method that tries to understand research participants' views about social realities [4]. The study uses a purposive sample, ensuring that the sources of each group are representative. The groups

are divided into two categories: church members and administrators, each with several age levels.

The analysis technique is based on the qualitative research paradigm. It is carried out in the initial order of collecting field and literature data. Then, the data is categorized into specific groups relevant to the research. The analysis stage is carried out by comparing field data, which is focused on disclosing as much experience as possible from the respondents. The goal is to find the correlation and influence on the research object. The conclusion of this study reveals the meaning of the data analysis results.

4.2. Grounded Research Method

Creswell explains that grounded theory is a systematic qualitative procedure that produces a theory that explains processes, actions, or interactions on substantive topics on a broad concept [5]. Borgatti explains that grounded theory is a theory developed from data based on the narratives, actions, and experiences of participants that are identified, coded, categorized, and constantly compared to one another [5]. From the definition above, it can be concluded that the grounded research method is a type of research with a qualitative paradigm that tries to understand reality based on a condition that has been patterned in the field to be developed into a new theory.

The philosophical concept behind grounded research is that the data obtained is a source of theory. In grounded research, the initial theory can be ignored, and researchers can go directly to the field to collect generally patterned data. The concept of grounded research is that data becomes a fact, and facts become a concept.

Grounded theory research aims to reconstruct the theory used in understanding phenomena. The final result of the theoretical formulation does not justify for all populations but only for those conditions. The general purpose of grounded theory research is to obtain data inductively, conduct theoretical development, and make decisions based on several evaluative criteria [6].

The systematic design stage in grounded research begins with the determination of the formulation of research problems that are sourced from identifying phenomena. Furthermore, it identifies the process of changing conditions, responding to changes, arising consequences, and elaborating consequences as part of the conditions. Theoretical sampling and data coding were carried out after preparing the participants related to permits and protection. Coding is carried out in several stages, namely open coding or sorting out data from interviews; axial coding, choosing one category as the core of the research phenomenon; and selective coding, which is the process of unifying and perfecting theories. The next stage is validating the theory by comparing it with similar research in the literature or asking outside researchers or participants to check the validity of the theory. The last process is writing a research report.

The architectural journal that is an example in the discussion of this grounded research method is a journal with the title "Fenomena Kotadesasi: Wangan dan Blumbang pada Permukiman Mendut, Jawa Tengah, Indonesia" [7]. Written by Ni Putu Ratih Pradnyaswari Anasta Putri and Made Suryanatha Prabawa, and published in UNDAGI, Scientific Journal of Architecture in 2017. The purpose of being achieved is to study the sustainability of social-communal spaces of wangan and blumbang in the Mendut settlement [7]. The research approach is grounded theory with a zig-zag process as the data analysis technique. The zig-zag process collects field data that is carried out continuously until the truth is found [7]. The study results show two main things: wangan as a norm of living and blumbang as a communal space.

4.3. Ethnography Method

From the Greek *ethnos* and *grapho*, ethnography means the systematic study of people and cultures. It is a participant-driven research effort that collects complete data to answer the initial research questions. Data is collected by selecting the best sources, and the researcher's participation in the environment of the research object is directly involved [8].

A philosophical concept in ethnographic research is the selective selection of informants. This research involves protecting and observing informants' human rights and interests and being sensitive to the consequences that will arise. The study also provides feedback reports to informants regarding the final results. Because this method involves multiple participants, it is hoped that more profound and complete data related to the research question will be obtained [8].

The ethnographic research procedure is cyclical, namely the selection of ethnographic objects, the submission of ethnographic questions, and the collection of ethnographic data with focused observations. The creation of ethnographic records can be in the form of field records, taking photos, making maps, and others. Data will be analyzed through the domain topic to obtain a general and comprehensive overview of the research object. Taxonomic analysis describes the selected domains in detail to determine the internal structure. The component analysis is used to find specific features in internal structures by contrasting elements, and cultural theme analysis is used to find relationships between domains and the whole.

The architectural journal that is an example in the discussion of this ethnographic method is a journal with the title "Ruang Andangan Arsitektur Limasan Sebagai Wadah Tradisi Kalang" [9]. Prabani Setiohastorahmanto, Sugiono Soetomo, and Agung Budi Sardjono wrote this journal. Published in the architectural journal Zonasi Volume 1 No. 2 in October 2018. The goal is to raise Wong Kalang's thinking on interpreting Limasan architecture [9].

The research approach used in ethnographic techniques is qualitative. The research steps start with the grand tour and then the mini tour to determine the key informants. Next, domain analysis is conducted, followed by taxonomic analysis, thematic observation, data grouping, and research results construction. The conclusion shows a relationship between the kalang tradition and the spatial setting of Limasan architecture in general [9].

4.4. Case Study Method

The definition of a case study is comprehensive and cannot be claimed as a single definition due to its many categories [10]. Taufik Hidayat revealed that a research object requires a series of detailed, in-depth, and intensive scientific activities [10]. The philosophical concept of the case study method presents the views of the subject being researched through everyday, real-life experiences. The case study invites the reader to find stylistic consistency, factual consistency, and trustworthiness in the research.

The conclusions in the case study method only apply to the research object and cannot generalize the results to other objects, even though this research is empirical [10]. A case study is an empirical data-based research that tries to examine a condition partially according to certain conditions and not to generalize.

The stages of case study research start with selecting a topic that will be the study's "body of knowledge." Then, the research examines research theories, formulates problems, collects data, processes and analyzes data, and concludes and reports research results. An architectural journal that is an example in the discussion of this case study method is a journal with the title "Identifikasi Pola Struktur Rumah Tinggal, Studi Kasus: Arsitektur Tradisional

Melayu Di Kota Pontianak" [11]. Written by Zairin Zain and Rinada Shafa Alam and published in Langkau Betang Journal, Vol. 4, No. 1, Year 2017.

The purpose of this study is to explore traditional Malay houses related to the structural patterns they use [11]. The research approach is a case study method focusing on a conventional Malay building in Bansir Laut village. At the same time, the analysis is carried out by describing the structure per segment based on the grids found in the research object. The study results showed the identification of building structures, including the lower, middle, and upper structures. Furthermore, a discussion was carried out on each structure related to its size and volume. The final process is the conclusion of the structure that supports the most among other structures.

4.5. Comparative and Correlational Method

Correlational research seeks to investigate the relationship of one factor to another based on considering relational coefficients [12]. The philosophical concept of correlational research is suitable to be carried out when the studied variables are complicated, so it cannot be done with experimental method research. In correlational research, measurements can be carried out on several variables. The output of the correlational method research is the level of relationship between research variables, not only related to the existence of the relationship between these variables.

The philosophical concept of comparative research involves collecting data after the event occurs. In this case, comparative research compares and searches for the cause-and-effect relationship of the variables. It also looks for one or more consequences and tests them by tracing back to the past to find the causes, possible relationships, and meanings.

The reason for using correlational research is to meet the need for information about the existence or absence of a relationship between two or more variables. In this case, manipulation of the variables cannot be carried out. The need must be met for the level of measurement of the relationship between several variables in the reality of the setting. Meanwhile, comparative research aims to test the influence between independent and dependent variables by not manipulating the variables and facilitating the understanding of historical events. It is done because it focuses on the differences between cases and events by bringing together researchers from different backgrounds and disciplines.

The first step in correlational research is determining the problem so that the research variables can be determined theoretically. Furthermore, homogeneous research subjects are chosen. Data is collected using questionnaires, tests, interviews, or observations. Data analysis uses bivariate correlation techniques to calculate the degree of relationship between one variable and another, ordinary correlation analysis when involving two variables, multiple regression analysis techniques, multiple regression, or canonical analysis.

Meanwhile, the steps in comparative research include selecting topics related to experiences or situations that have occurred in the field. Review the literature to help identify independent and dependent variables and identify foreign variables that may contribute to cause-and-effect relationships. Furthermore, develop a hypothesis, select a comparison group, and select a variable measuring tool. The last stage is analyzing and interpreting results using descriptive and inferential statistics, such as t-tests, variant analysis, or chi-squares.

The architectural journal with the comparison method is titled "Pengaruh Desain Interior Perpustakaan Terhadap Pembentukan Citra Positif Perpustakaan" [13]. It was written by Miyarso Dwi Ajie and published in Edulib in 2011. This study aims to analyze the influence of interior elements on a library, which can form a positive image of a library [13].

The quantitative research approach uses path analysis and the SPSS software program. The independent research variables, including the library interior design's physical and spiritual aspects, were determined initially. In contrast, the dependent variables included perception, cognition, motivation, and attitude. The study results showed that physical and non-physical factors significantly influenced the formation of a positive image of the library [13].

4.6. Ex-Post Facto Method

Ex-post facto research examines the causal relationship between objects without manipulating them. It is based on the assumption that a variable will cause other variables and their consequences [14]. Ex-post facto research tries to find the relationship between two variables that have been determined in advance based on theoretical studies, including assessing the level of relationship between the variables. The philosophical concept of ex-post facto research states that it collects data after all events. First, it determines the dependent variables to find the causes, relationships, and meanings. The ex post facto study aims to explain the interconnection and influence between the variables in the research and to seek clarity on how these symptoms can occur.

The first step in ex-post facto research is to formulate a problem as a trigger for the emergence of dependent variables. Furthermore, conducting hypotheses, grouping and collecting data through questionnaires or interviews, conducting data analysis using T-test analysis techniques, independent or ANOVA, interpreting results, concluding the relationship between variables, and preparing research reports.

For example, the architectural journal with ex-post facto method is a journal with the title "Evaluasi Tingkat Efisiensi Penggunaan Energi Kajian Ex-Post Facto Penerapan Standar Green Building Gedung A ITSB" [15]. This journal was written by Muhammad Arief Irfan and published in Planners Insight, Urban and Regional Planning Journal in 2019.

This study aims to determine the ability of green buildings to reduce the energy used. The research approach used is an ex-post facto method with an energy audit method, which includes an initial energy audit, a detailed energy audit, identification of energy-saving opportunities, and an analysis of energy-saving opportunities. The study's results prove that there is an ability to reduce the use of electrical energy in buildings with green building standards [15].

5. Conclusion

From the explanation above, it can be concluded that research methods, especially those used in dissertations, are only tools for researchers. The topic and objectives of the dissertation determine the research method to use. Each method has its role, purpose, concept of thinking, and stages. Researchers must anticipate each method's advantages and disadvantages. Determining research methods is essential to ensure the success of research in achieving its goals.

In addition to revealing the reality according to the research results, there is a fundamental difference related to the depth of research between undergraduate, graduate, and postgraduate programs. In the undergraduate program study, the researcher only discloses the research results according to what is obtained. Meanwhile, the researcher must provide meaning for the results in the graduate program. As for the postgraduate program, besides revealing the research results and giving meaning, the researcher must also find a new theory related to the research results.

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