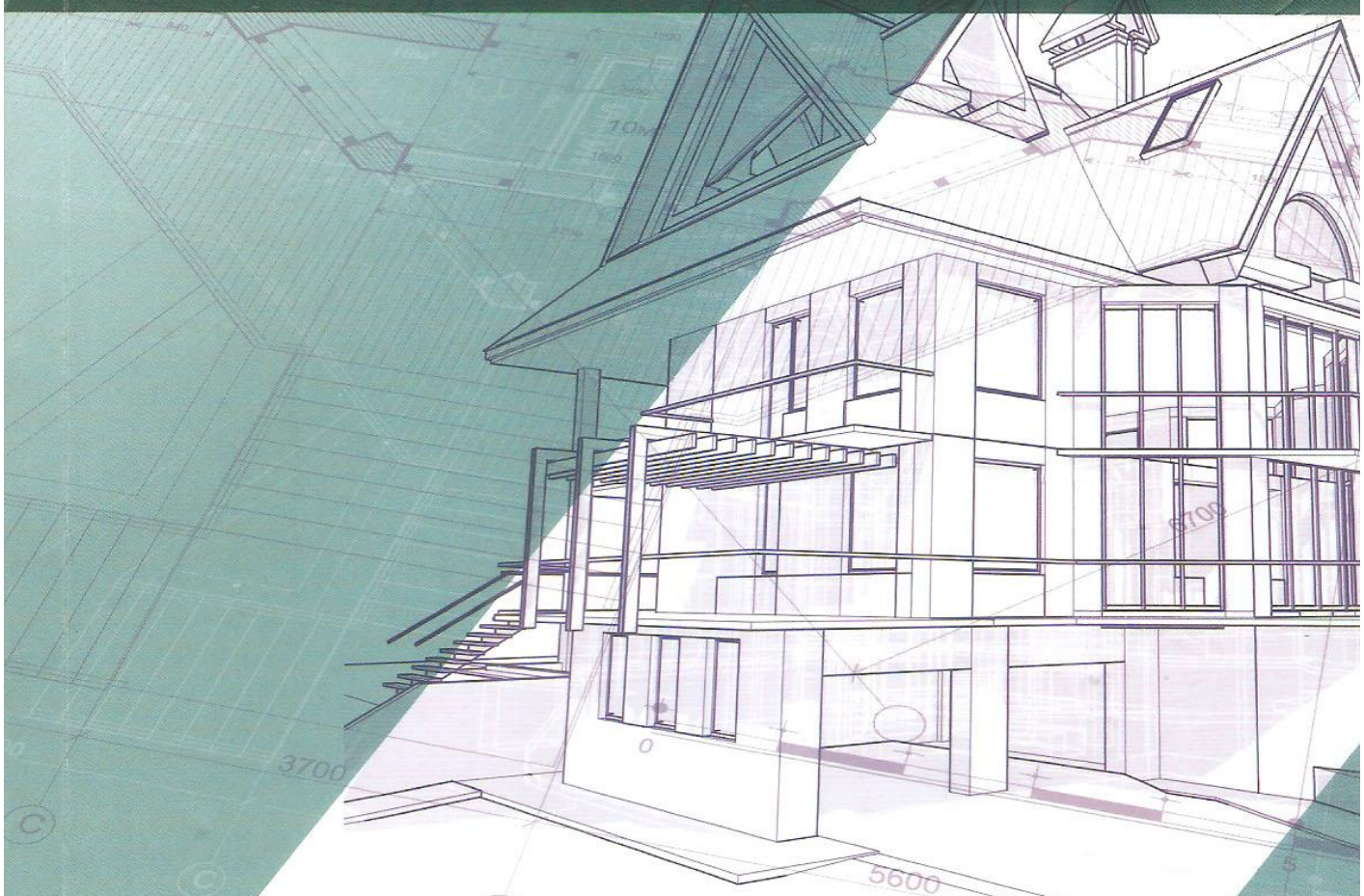
Methodologies in Architectural Research



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Fadzidah Abdullah

2.1 Introduction

This paper explains the step-by-step research approaches adopted while undertaking research thesis titled "An Evaluation of Problem Based Learning in Architectural Education." This research was designed using the phenomenological approach of case study research. This research is organised around six major topics; the study region, the paradigm and methodology, research method and procedures, analysis of interview data, some ethical considerations and conclusion. This type of interpretative single case study research was selected because it allowed the use of a deduction mode of using the knowledge and information to understand something and form an opinion. Designing research methodology for the thesis requires prior identification of research aim, and objectives. Therefore, careful consideration should be undertaken so that strategies could be designed to achieve the objectives of research. For understanding of this research design, it is important to have context of the research background.

The research has the aim of understanding the phenomena influencing the termination of Problem Based Learning (PBL) implementation in the Faculty of Architecture at Technical University of Delft, Netherland (TUDelft). An evaluation was carried out using the followings research objectives; to investigate if the PBL pedagogical approach gave a workable theoretical framework to architectural education; to examine the process of adaptation and implementation of PBL in the Faculty, as compared to other architectural institutions and other disciplines of studies; to identify the changes influenced by the introduction of PBL in the Faculty of Architecture at TUDelft; to investigate the acceptance of PBL among people involved in the implementation; and to suggest appropriate ways to improve the implementation of PBL in architectural education.

The aim and the objectives formulated for the research show how they resulted in the selection of the qualitative research format, which was the interpretive case study. The procedures focused on three issues: identifying the research strategies, selecting data collection methods, and choosing data analysis methods. Research strategies were identified to meet the research objectives. Data was sought from documentation of the PBL implementation, and first-hand accounts were sought from educational and architectural specialists, with experience of PBL implementation in the

Faculty of Architecture at TUDelft. Since the former was carried out as part of the literature review to form the framework of the analysis, the latter was conducted using focused face-to-face interviews to fill the gaps found in the earlier investigation. The interviewees were chosen based on their involvement in the PBL implementation at TUDelft. Consequently, analysis of interview data was carried out by using content analysis method.

These identified research strategies were known as "archival" and "opinion" (Buckley at. al., 1975), where techniques of content analysis and interviews were vigorously applied. These identified research strategies led to the decision to select the research format to be undertaken in order to achieve the strategies. Applying a "deduction" mode of using the knowledge and information to understand something and form an opinion, the research was designed using a phenomenological approach of Case Study. Data would be collected, based on the formatted research design, and displayed so that analysis and discussion of the findings would be made possible.

2.2 Paradigm and Methodology of Case Study

This section outlines the overall structure of the research framework and justifies the use of a phenomenological approach applied in the research. Description of the research design is substantiated with an underlying theoretical explanation of the chosen method.

A phenomenological approach was chosen as the main methodology in undertaking the research of case studies. Generally, this so-called qualitative research design is often done intensively, and yet offers great flexibility in term of application of research methods. In addition, the analytical method of a phenomenological approach might be quite systematic although the result would not be treated as representative (One Plus One, 2004). Instead, an understanding of the significance of different representations allows interpretative judgment of the research synthesis to be done in the areas where less is known.

In accord with the phenomenological approach of case study research, this research of PBL in architectural education represented a singular event that would never be replicated because the analysis of data focused on specific themes of content. The "singular event" referred to an explanatory case study of the PBL Implementation in the Faculty of Architecture at TUDelft. However, comparison to the same set of events was considered crucial to "pose competing explanation" (Yin, 1994) that might strengthen understanding of the research synthesis. In this instance, the description of PBL implementation in the Faculty of Architecture at University of New Castle, Australia (UniNC) was used as the comparison to allow understanding of the significance of different representations.

Although there are various research methods in the phenomenological approach, case study was selected over survey, observation, and experiment because it enabled the writer to focus on subjects under investigation; the reason behind the discontinuity of PBL implementation in the Faculty of Architecture, TUDelft. Case study is an associated methodology under qualitative research design that correlates research with "developing an in-depth analysis of a single case or small number of cases" (Creswell, 1998). In the instance of the paper, research project mainly focused on studying one particular case study, the Implementation of Problem Based Learning in the Faculty of Architecture at TUDelft. This case study was considered to be an "explanatory case study" because it described "causal inquiries" of how and why (Yin, 1994; Tellis, 1997). Yin (1994) notes that case study method is normally used because researchers want to deliberately cover "contextual conditions" of why and how certain "decisions" are made, either in "individuals, organisations, processes, programmes, neighbourhoods, institutions, or events."

The Faculty of Architecture at TUDelft was chosen as the main case study because it was the first architectural faculty in Europe to implement PBL as an educational approach to learning architecture. Based on the research questions identified in the research, the study sought to determine how and why PBL was implemented in the Faculty of Architectural at TUDelft, and why the implementation was discontinued whilst claiming its success. Subsequently, the findings of the research determined whether PBL was an appropriate pedagogical approach to be introduced in Architectural Education throughout the globe, or not.

2.3 Justification for the Methodology Used

Case study research methodology was the most appropriate methodology to approach the subject studied, because it enabled the writer to look in depth at issues related to the implementation of PBL, although the writer did not have control over the event. It also enabled the research to "focus on meanings, try to understand what is happening, look at the totality of each situation, and develop ideas through induction from data" (Creswell, 1998). In this way, a single case study could be seen to satisfy the three tenets of qualitative research methods: describing, understanding, and explaining, providing it met the established objective (Tellis, 1997). In this instance, an evaluative application of describing, understanding, and explaining the PBL implementation in the faculty of Architecture at TUDelft was carried out to assess the effectiveness of educational initiatives. This type of investigation could not be done by merely quantitative techniques, due to the nature of empirical research that tends "to obscure some of the important information" to be uncovered (Tellis, 1997).

The main data collection methods used in this research study was documentation review and interview survey. For practical reason, other types of data

collection methods also sometimes used in the case study research approach, such as survey, observation, and experiment, would not be used in this research. The exclusion of observation and experiment was due to the nature of this research, which required investigation of a PBL implementation in the Faculty of Architecture, TUDelft that had been discontinued. In this instance, the PBL implementation in the faculty was considered as history. Therefore, observation and experiment methods, which usually require the subject investigated to be present, could not be done because the researchers could not play the major roles in the event to be observed and experimented. Something that had happened in the past could not be available to the researcher to participate in the subject of research directly.

Moreover, this research also did not use survey as part of its research design, simply because this research did not aim to produce "laws" or generalization in the same way as quantitative methods. The use of a small number of interviewees could not provide an adequate basis for inferential statistics (Creswell, 1998). Instead, this research aimed to provide awareness of the crucial roles of pattern and context via a non-laboratory setting, in which research was facilitated by the "most hard to specify stimulus, the human face" (Yin, 1994).

Hence, the data collection methods of documentation review and interview were left as the strategic options to carry out the research. Document review was useful for making inferences about events, whilst focused interview was used to confirm data collected from the documentation review. In order to get first-hand accounts from educational and architectural specialists on the experience of PBL implementation in the Faculty of Architecture at TUDelft, the research demanded face-to-face interviews in the case study research. Besides, this focused face-to-face interview provided "a humanistic validity" (Yin, 1994), whilst the review of documentation provided substantial information to scientifically and iteratively corroborate the evidence from the former source, thus ultimately provided the research synthesis in the case study. This combination of interview and documentation review as research strategies provided comparative explanations to satisfy the "ethical need" of confirming the validity of the processes (Tellis, 1997).

2.3.1 Research Method and Procedures

In this case study research, data collection methods were done through document review and interviews. Document review of the PBL Implementation in the Faculty of Architecture, TUDelft, provided the framework of this research study that had been generated by the research questions. Meanwhile, face-to-face interview was chosen as one of the data collection methods to explore individuals' opinion in depth about the PBL implementation subject studied.

2.3.2 Unit of Analysis

Choosing unit of analysis for case study research is very important to ensure accuracy of the information gathered. For this research, three main people who had different and specific roles in the implementation of PBL in the Faculty of Architecture, TUDelft, were chosen as units of analysis in this case study research because of their direct involvement in the PBL implementation process. They were expected to give their individual perceptions in detailed accounts of PBL implementation. The first interviewee was chosen was responsible for the enforcement of the implementation. He was expected to give personal accounts on the implementation of PBL in the faculty based on management point of view. The second interviewee was because as a specialist in education, he was responsible for providing training for the architecture faculty members. He was expected to provide viewpoints based on pedagogical perspectives. The third interviewee was one of the faculty members, who taught Computer Aided Design during the implementation of PBL. He was expected to give comment on architectural and practical aspects of PBL implementation in the Faculty of Architecture at TUDelft.

2.3.3 Instruments and Procedures of Data Collection

Prior to the interview session, relevant documentation about the implementation of Problem Based Learning in School of Architecture, TUDelft, was examined. This review of documentation provided the basis framework for the studies, and led to the finding of several gaps in the implementation, which ultimately helped formulate the research questions.

Questions were formulated in order to fully understand the constructs of the implementation. Semi-structured questions were prepared prior to the interview to ensure the focus of information collected. The questions mainly functioned as the instruments in the effort to obtain answers to the research questions. The questions were divided into seven (7) main categories, as follows:

- Conceptual Framework- to further clarify the concept and philosophy of the implementation
- Implementation - to provide in-depth information about the implementation.
- Comparison with Other Approach – to examine the model of Problem Based Learning in architectural schools as compared to other professional disciplines of education.
- Changes in Curricula, and Management – to examine the changes and transformation involved during the implementation of Problem based Learning.

- Staff Commitment – to understand the overall involvement of staff, in terms of commitment, acceptance, understanding and perceptions.
- Students' involvement – to check the students involvement
- Conclusion – summary of the implementation account.

Semi-structured questions in face-to-face interview session "allowed the respondent freedom of expression, yet still produced data that the researcher considered essential" (Simister, 1995). Besides, the flexibility of semi-structured questions in face-to-face interview provided an opportunity to have the interview sessions appear informal, thus giving an opportunity to the interviewees to deliver data which are not usually expressed in written documentation. This type of interview was known to be relatively easy to control as the interviewer had the opportunity to lead and guide the conversation within the subject discussed (Denscombe, 2003). In addition, applying the data collection method of face-to-face interview allowed the interviewer to address "further inquiry" whenever necessary (Yin, 1994).

However, there was also a limitation to the method chosen. It was noticed that, although semi-structured questions were addressed to the interviewees, most of the time the answers received were not focused on the subject asked. It was difficult to control the conversation specifically around the subject asked, rather the conversation always diverted from the topic. Interrupting the experts might be considered rude, while letting them get carried away was not preferable because the researcher needed to optimise the time available for the interview sessions. More effective control of the interviews might have been possible with stronger preparatory communication skills training for the interviewer.

Interview was the best option as tool of data collection when looking at individuals' perception because it provided good interaction via eye contact and tone of voice, and presented emotion of verbal communication. Interview had "an element of personal interaction between the researcher and the respondent not present in other forms of data collection" (Simister, 1995). Through personal interaction, interviewees might give personal opinion about the issues discussed which had not been exposed in written format anywhere else.

The interviewees were contacted via email, some months prior to the preparation of research questions. This correspondence was to get their personal agreement to be interviewed, as subjects of research analysis. The programme of the interview sessions, with suggested times, dates and venues of the interview sessions, was sent to the interviewees via emails. This correspondence also helped in the preparation of questions, based on the interviewees' possible experience and involvement. The interview session could be carried out only once the agreements from

the interviewees had been secured, and the semi-structured questions were satisfactorily prepared.

With permission from the interviewees, note taking and tape recorder were used as aids to the interview sessions. The purpose of using tape recordings to record the conversation in the interviews sessions was to avoid missing out on data. In this research, neither the interviewer nor interviewees were native English speakers. As such, it was expected that the conversation in the interview sessions might not go smoothly because of communication problems. However, the tape recording of the conversation would ensure all subjects discussed were captured for future transcribing of data into verbatim form.

Besides that, data from the interview session was also recorded in textual format by means of note taking. During the interviews, the interviewer might catch some of the essence of the conversation and have reflective remarks on some of the subjects discussed. Hence, note taking was used to ensure these reflective responses would not be forgotten after the conversation ended. The process of note taking was essential because it functioned as the collection of reflective ideas obtained while listening to the conversation, as the textual capture of emotions involved in the expression of interviewees, and as a reference during the analysis of data.

2.3.4 Limitation of Data Collection Method

Case study research did not have uniform protocols (Tellis, 1997), perhaps partly because the literature available on case study research was “primitive and limited” (Yin, 1994). Although this might be considered as providing freedom for a researcher to formulate a personal method of research, yet it does create difficulty in avoiding criticism of its primacy.

During the interview sessions, note taking was carried out as an aid for analysis to be done later. Nevertheless, note taking during conversation might result in limitation of the interaction between interviewer and interviewees, especially eye contact. Eye contact was known to be essential to see the emotion involved during discussion. The lack of eye contact might lead to an over-formalised conversation. Regarding this, one of the interviewee questioned the attempt to take notes, suggesting that he preferred an interviewer to listen to him attentively.

2.4 Analysis of Interview Data

2.4.1 Content Analysis

Choosing unit of analysis Data collected during the interview sessions would not have any meaning without analysing them. In order to make the data obtained during the

interview sessions useful, several processes of content analysis were done. In its simplest format, content analysis was the "extraction and categorization of information from text" (Simister, 1995). In this instance, content analysis was done on the interview transcripts to extract meaning and categorise sets of information regarding the implementation of PBL in the Faculty of Architecture at TUDelft. By doing content analysis, the process of "describing, understanding, and explaining" (Tellis, 1997) the findings of the case study research would be made easier, as compared to trying to find information from the whole interview transcripts.

There were 9 main activities involved in the process of content analysis: transcribing the recorded data into verbatim format, coding of the collected data, adding reflective remarks to the data, adding marginal remarks to the transcribed and coded data, categorizing of data, data reduction, data displays, analysing meaning of the data, and drawing conclusions.

2.4.2 Transcribing the Interview Transcripts

Transcribing was the first step in content analysis after the collection of data via the interviews. It involved the process of transferring the tape-recorded data into textual format for ease of analysis. The recorded data was transcribed into verbatim format, as closed as possible to the original conversation taking place during the interviews. Some limitations appeared during this process of transcribing.

Since both parties, the interviewer and interviewees, were not native English speakers, the recorded format appeared to have many grammatical errors, unclear pronunciation, and too many pauses taken to find the correct choices of words. As a result, this already lengthy and tedious process was made worse because it was so time-consuming. However, it was essential that this process be done properly because the transcripts produced were the basis for analysis.

To reduce the burden of having the tedious task of transcribing, notes taken during the interview sessions offered a great help to the transcribing process, especially if the taped words were inaudible. With the completed transcript at hand, data retrieval was made easier as compared to listening to tape recorder for analysis.

In interview session, it was hard to control the conversation around the subject questioned. Some of the information needed for certain questions was answered at different times, while a different question was being addressed. As such, information appeared scattered all over the transcripts, which were difficult to comprehend in the original conversational sequence. Therefore, before beginning the analysis, the textual data needed to be coded and categorised in the sequence of the prepared semi-structured questions.

2.4.3 Coding the Collected Data

Coding was generally used for the purpose of "systematically searching data to identify and to categorise specific observable actions or characteristic" (Tellis, 1997a). In this instance, coding was used to label sections of text that related to a certain topic, or to a certain question. The coding system was formulated in the same sequence as the prepared list of semi-structured questions. However, the nature of a semi-structured interview with open responses provided ample opportunity to interviewees to give additional information that was not asked by the interviewer. This additional information might be important to the research. As such, additional codes were provided to label this extra information. For example, there were only two questions in the category of conceptual framework: both were regarding architectural educational approach in architectural education. However, information gathered about the subject included the definition of Problem Based Learning. Therefore, additional codes were needed to label the extra information.

In the coding process, a printed version of the transcripts was read several times to retrieve information, and consequently be labelled with the appropriate codes. Besides labelling the text in the transcript with codes, marginal and reflective remarks were added to the transcript hard copy. These informal forms of notes were used later in the analysis process. The coded transcript would then be categorised and arranged in a new format of information displays for easier analysis.

2.4.4 Adding Reflective Remarks

Besides taking notes on important information during the interview sessions, the remarks on responses and reflections were noted upon the interviewees' answers and statements. These notes might be highlighted later when embarking on data analysis process. Research specialists recognised the practice of jotting down reflective remarks as an important activity during interviewing. Miles and Huberman (1997) defined reflective remark as raw field notes about the field-worker's reflections, and commentary on issues that emerged during the process. It added substantial meaning to the write-up, not least to other readers. It usually strengthened coding, in pointing to deeper or underlying issues that deserve analytic attention (Miles and Huberman, 1997).

2.4.5 Adding Marginal Remarks

Similarly, some reflective ideas and reactions were noted whilst in the process of data analysis. In research, these textual ideas are known as marginal remarks. However, although marginal remarks are analogous to reflective remarks, they were not done during data collection process. Instead, the process of adding marginal remarks was intensively carried out during the data analysis process when some more new ideas were continuously added throughout the analysis process. Capturing the emerging ideas

in textual format was important as they suggested "new interpretation, leads, connections with other part of the data," and they usually pointed towards questions and issues to look into during the next wave of data collection, if applicable (Miles and Huberman, 1997). In addition, those captured ideas would also give direction on ways of elaborating some of the research findings.

2.4.6 Categorization of Data

As mentioned previously, the textual data was categorised and arranged in the same sequence as the prepared semi-structured questions. Based on the codes labelled to sections of text earlier, text from the three different transcripts was broken down into discrete sections (Simister, 1995), and transferred into categories in new documents. In this process, text excerpts from three different interviewees were combined together according to similar categorisations. As such, there were seven documents produced for the seven categories of the codes. The combination of excerpts from the three different transcripts would later ease the process of comparing interviewees' ideas.

Some of the content of the transcriptions appeared unnecessary for the research project. Therefore, the data were intensively reduced, in order to format the text into useful categories.

2.4.7 Data Reduction

During the categorisation process, data was organised in such a way that final conclusions could be drawn and verified. Besides, intensive data reduction was done to some of the insignificant pieces of information in the transcripts. This process was described by Miles and Huberman (1997) as the process of selecting, focusing, simplifying, abstracting, and transforming the data that appeared in written-up or transcriptions. The process of data reduction occurred continuously throughout the content analysis of this research.

2.4.8 Data Displays

Displaying the data obtained from the interview session was the most important process to ensure the data could be easily understood by readers. Different types of data displays, such as matrices, charts, and networks, were used to show the relationships between information presented. Good data displays were a major avenue to valid qualitative analysis. In this research, intensive analytic activities were required to display data, which had appeared in a dispersed and poorly structured textual format. Only with organised and well-structured displays of data could conclusions be drawn.

Accordingly, Miles and Huberman (1997) described a display as an organised, compressed assembly of information that permits conclusion drawing and action. It functions to reduce complex information into selective and simplified gestalts or easily

understood configurations. These “analytic activities” were designed to assemble organised information into an immediately accessible, compact form so that the analyst could see what was happening, and draw justified conclusions.

2.4.9 Analytical Analysis of Meaning

The whole process of data analysis was iterative and cyclical, rather than sequential. As such, well-documented processes of this overall content analysis were necessary. Having well-documented processes would eventually help to understand clearly just what was going on during the analysis process, in order to reflect and refine the methods undertaken, and probably make them usable to others.

Although this case study research produced a massive amount of data in textual format, no computer-assisted data analysis program was used. No doubt computer assisted data analysis program would have made the process of retrieval of data much easier, but the nature of this case study research required a high amount of cross-references which could be comfortably done with word processing software and hard copy format. In addition, most of the data should be analysed in context, which was lacking in available computer-assisted data analysis coding systems. The theory-generating features in many of the computer programs were limited to producing a basic format of networks, whilst this research required the use of several forms of matrices for data displays. The whole process of intense analytical handling made it difficult and complicated to embark on becoming familiar with so many options of computer assisted data analysis software. Furthermore, the nature of this research was not intended to produce any law of generalisation in which examination of repetition of words was important. Therefore, the use of a computer-assisted program to perform content analysis in this study was not necessary.

2.5 Drawing Conclusions

The discussion on data displays and its meaning led to the drawing of conclusions. According to Miles and Huberman (1997), conclusion drawing is the practice of “noting regularities, patterns, explanations, possible configuration, causal flows, and proposition” of information. Such conclusions from the data analysis helped to answer the research questions of the thesis, and provide an understanding of the research phenomena.

Nevertheless, the meanings emerging from the data have to be tested for their validity. In this instance, the design of a single explanatory case study research required the construction of an “internal validity”, in which multiple sources of evidence were used as the way to ensure construct validity (Tellis, 1997b). Since this research had data collected from documentation review and interview, cross-referencing was cyclically

done between both materials to construct a “corroborating mode” of validity (Tellis, 1997a).

2.6 Ethical Consideration

During the data collection process of interviews, there were three obvious ethical considerations. Permission was sought from the interviewees on instruments to be used during the interview, respected the time allocation for the duration of the interview sessions, and managed the interviews in ways most convenient to the interviewees.

Permission was sought from the interviewees about the use of tape recorder and note taking prior to the commencement of interviews. As expected, all the three interviewees granted their permission on the use of tape recorder, but one interviewee seemed to prefer the interviewer to listen to him attentively without taking notes. Moreover, another interviewee requested that he should be notified if any of the content of the interviews was to be published.

In addition, the time allocation given by the interviewees was respected. Although it was suggested that the interview session would take two hour of each interviewee’s time, only two of them agreed with the proposal. One of the interviewee said he could only spare one hour for the interview to take place. Lastly, the date, time and venue of interview sessions proposed also took into consideration whatever was the most convenient for interviewees.

As suggested by research specialists, a set of rules of conduct was also observed during the data analysis process. The importance of observing the ethical issues in doing research was raised by Denscombe (2003), stating that researchers should produce truthful and transparent research; should not do any harm while doing research; should conduct randomised controlled experiments; should observe privacy and confidentiality; and should observe legality and professionalism. Although the process of doing this case study research did not deal with controlled experiments, every effort was made to observe the other issues listed.

2.7 Summary

This research was an example of a single case study research in multi-disciplinary fields of architectural education and Problem Based Learning. Specifically, this research would provide a critical analysis of the implementation of Problem Based Learning educational approach in architectural tertiary education. It was hoped that this research would encourage educational specialists and architectural professionals to have a greater enthusiasm for improving architectural education by appropriately applying formal pedagogical innovation in architectural curriculum structure.

Using a phenomenological research approach as its paradigm, this research employed the use of interviews as the main data collection method, and content analysis as the main analysis method. Unfortunately, guidance on the how to employ manual content analysis in a phenomenological approach of a single case study within educational research was severely limited. As such, the method of manual content analysis of interview data obtained from specific participants, or in this case the interviewees were called units of analysis, needed to be explored further. Having made the attempt to explore this type of research, it was hoped to expand the horizon of phenomenological qualitative approach of single case study research.

References:

Buckley, J.W., & et. al (1975). *Research Methodology and Business Decisions.* National Association of Accountants & The Society of Industrial Accountants of Canada.

Creswell, J.W. (1998). *Qualitative Inquiry and Research Design: Choosing Among the Five Traditions.* Thousand Oaks, California: Sage Publications.

Denscombe, M. (2003). *The Good Research Guide for Small-scale Social Research Projects* (2nd. ed.). Buckingham: Open University Press.

Miles, M.B., & Huberman, M.A. (1997). *An Expended Sourcebook: Qualitative Data Analysis.* London: SAGE Publications.

One Plus One (2004). *A Guide to Research Methods.* Retrieved January 30, 2005, from http://www.oneplusone.org.uk/projects/projectimethod.asp

Simister, S. (1995). *Case Study Methodology for Construction Management Research (ARCOM).* 18-20 Sept. University of York.

Tellis, W. (1997). *Introduction To Case Study (68 paragraphs).* The Qualitative Report, 3 (2).

Tellis, W. (1997a). *Result of a Case Study on Information Technology at a University (76 paragraphs).* The Qualitative Report, 3(4).

Tellis, W. (1997b). *Application of a Case Study Methodology (81 paragraphs).* The Qualitative Report, 3 (3).

Yin, R.K. (1994). *Case Study Research: Design and Methods.* London: Sage Publications Inc.

Methodologies in Architectural Research

This book is intended to appeal to people interested in doing research in architecture and the built environment Being both comprehensive and could act as an entry level point into the world of research in architecture, this book targets primarily, final year undergraduate and post graduate students and anybody interested in doing research in these field. Through the topics covered in the book varied methods researches were introduced to, perhaps, whet the interests of budding researchers as how to conduct their impending issues and questions yet unanswered. Although the topics covered are not as varied but it would serve as a guide to construct and undertake a research project as offered by the authors in answering their research question.

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