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Towards Developing Empathetic Young Engineers for Rural Road Project Management

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TOWARDS DEVELOPING EMPATHETIC YOUNG ENGINEERS FOR RURAL ROAD PROJECT MANAGEMENT

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Abstract - Opening up rural areas through road construction will not only improve livelihoods but also unlock opportunities for employment creation as a crucial and vital component of poverty eradication. Unfortunately, **w**e are constantly been reminded at the project management engineering failure happening in the rural areas. Previous research had shown that there is an interaction between good project and empathy. In the absence of the vital experiences of working in the rural area, learning to be empathetic can help young engineers to face extreme challenges in managing unique challenging projects and further contribute to good projects. By conceptualizing the empathy aspect of the technical Guideline for the Design of Low Volume Rural Road (LVRR) document and the experienced practice engineer involved in the program, the analysis of these implicit and explicit empathy designs will be used to develop empathetic training module. The absence of any prior research that conceptualized empathy of the LVRR guideline indicate that this will be a step forward in the attempt to inculcate empathetic skill through online module which initiative is in considerations of cost and logistic issues faced at the rural area. This online module is a viable alternative to printed modules as physical training is not feasible at this time of coronavirus outbreak that had caused the majority of people working remotely. The development of the formative online competency module for empathetic young engineers is part of the enhancement of technical skill and as a solution to a widening gap of understanding between the engineering project management such as design and planning and the users need for a sustainable project management in the rural area.

Key words: Empathetic, Young Engineer, Low Volume Rural Road, Online Module, Competency

1 Introduction

Empathy, or the ability to understand and experience the feelings of others (Jolliffe & Farrington, 2006), plays a fundamental role in personal and social development and is believed to be a basic element in facilitating social integration and cohesion within a community (Ware, Hopper, Tugenberg, Dickey, & Fisher, 2008). Changing the emphasis from the outcome to the commitment of empathizing is very relevant and necessary for engineers to remain empathic when interacting with stakeholders who come from different background. Instead of assuming empathy as a result of following given recipes for listening or observation, perhaps engineers will benefit from recognizing the "incommensurability" across different epistemic and cultural communities (Bernstein et al, 1992).

Traditionally, engineering as a profession has only focused on a technical skill such as design, modelling and problem solving. For young engineers especially, these skills are undeniably important but if engineers were to become more empathetic and caring, diversity may increase and solving people's problems would become more prudent (Hess 2012).

Advancements in technology, the drastic transformation in societal needs and a knowledge-based economy are creating a strong need for engineers to continuously improve their skills and competencies (Talib 2020). To remain competitive, it is particularly important that engineers practice lifelong learning and exhibit outstanding leadership qualities. In this context, learning is not restricted to the ability to sharpen and enhance technical knowledge and skills.

2 Problem Background

Each year, the government has been funding infrastructure projects such as low volume rural road program

to improve economic growth for the population in the remote area. The infrastructure project is integral to the development of rural areas as the conditions of roads and modes of transportation are not in a well-developed state, which are imposing problems for individuals transferring from one place to another (Kapur 2019). In Malaysia, Public Works Department (PWD) is the executing agency in managing the development of the Low Volume Rural Road (LVRR) and the program is under the purview of the Ministry of Rural Development Malaysia.

Basically, designing roads requires a delicate balance between the physical demands of a project, the realities of constraints faced by owners and operators, and the need for the design to recognize the setting of the asset in the environment. From feasibility studies to planning, design, procurement, construction supervision, and post-construction assessments, engineers are required to ensure optimal efficiency and safety, while minimizing costs and environmental impacts. A careful consideration of [external and structural] conditions can yield a checklist for use during project identification and design to assess the potential for poverty reduction through road development project (Hettige 2006).

Engineers must acquire the right attitude and work ethics because "attitude, not aptitude, will determine one's altitude". A career in engineering can be extremely challenging as engineers often have to deal with sudden emergencies and life-threatening situations in their daily work (Talib 2020). So as an option, in the absence of the vital experiences of working in the rural area, learning to be empathetic can help young engineers to face extreme challenges in managing unique and challenging projects. Based on Delaine et al (2015) the commitment to empathetic communication is particularly important when engineers work to meet the needs of underserved communities. Scholars working on the intersection of engineering and community engagement have pointed out the critical importance of listening and forming genuine partnership with community members in order to define engineering problems and solutions that are meaningful to the local communities.

For young engineers who have yet to obtain enough experiences of working in the rural area, learning to be empathetic can help them to face challenges in managing isolated and distinctive road projects.

The coronavirus outbreak has affected the economy in general and had caused the majority of people working remotely and communicating remotely. This online module is a viable alternative to printed modules as physical training is not feasible at this time of the outbreak.

Tang, X. (2018) suggested two alternative conceptions of empathy in engineering: 1) empathy as a commitment to communicating and understanding across different cultural and epistemic communities; and 2) empathy as a professional excellence for engineers. Empathy describes both the skillset and the outlook of an excellent engineer, and like other virtues, it can be cultivated through education.

2.1 Problem Statement

Well planned rural road connectivity facilitate trade, social exchange, health, resource extraction and mobility. As a result, opening up rural areas through road construction will not only improve livelihoods but also unlock opportunities for employment creation as a crucial and vital component of poverty eradication.

We rejoice at the successful development project implemented and completed, but we are also constantly been reminded at the engineering failure of project management happening in the rural areas. Issues and reports such as roads and bridges collapsed/sliding, slope of hillside development failure/sliding, fatality accidents during construction and project completed that does not meet the users need which end up as a 'white elephant' projects have been a growing concern especially to the implementing agency who have to be answerable to the concern raised by member of the public. Normally mitigation through short term strategies would be taken by stakeholders to solve the issues thus eventually a long-term strategy would have to be planned for a sustainable solution to the recurring issues. By strengthening the capabilities of engineers understanding of a good project management, this can help to mitigate project failure and provide good successful projects.

There is an interaction between good project and empathy. Based on (Vallero and Vesilind 2006), their case study show that the lack of empathy resulted failed engineering design. Justin L. Hess et al (2012) suggest that if engineers were to become more empathetic and caring, diversity may increase and solving people's problem would become more prudent. Inculcating empathetic skill in young engineers is vital but unfortunately as of current the skill have yet to be inculcated in young engineers as probably, we have not grasped the understanding

of the empathetical requirement for engineer working on project management especially in the context of rural area.

Since there is the Low Volume Rural Road (LVRR)(JKR Sarawak and UNIMAS 2015) design guideline book available for the engineers' convenient, the move to conceptualized its cognitive and affective empathy aspect seems to be the right approach. Furthermore, based on Venetsanopoulos, A.T. (2004) cultivating one's "soft" skills are advised for young engineers. By learning empathy from a more experienced practice engineer involved in the program, young engineers would learn valuable fundamental skill in properly managing the rural project. The absence of any prior research to conceptualized empathy based on available guideline and prior experienced rural engineers indicates that this will be a step forward to inculcate empathetic skill for young engineer.

The coronavirus (Covid-19) outbreak has affected the economy in general and had caused the majority of people working remotely and communicating remotely. This online module is a viable alternative to printed modules as physical training is not feasible at this time of the outbreak. It is an attempt to look into new ways to engage learners and provide them with a more interactive learning experience. The initiative can also be considered as a response to cost and logistic considerations. With rapidly increasing access to, and use of, digital technology worldwide, there are new opportunities to leverage training and support for those who are working in rural and remote areas (AMA, 2017; Lamph et al, 2018) and digital platforms to continue professional development, education and support for rural professionals outside the university and tertiary training sectors to broaden their knowledge, expertise and competence, and develop the personal and professional qualities required throughout their professional lives (AHPRA, 2022).

The study will be conceptualizing empathy based on the LVRR Design Guideline and the practice of experienced engineer managing the road project. The study will also develop an online competency module for empathetic young engineers involved in managing the program.

2.2 Research Objectives

There are two objectives of this research. Firstly, is to conceptualize empathy in the LVRR Design Guideline and the practice of experienced engineer managing the road project. The second objective is to develop online competency module for empathetic young engineers involved in managing the program as an innovation to provide training for a more prudent young engineer.

2.3 Scope and Key Assumptions

The boundary of the research are engineers involved in managing LVRR Program under the Ministry of Rural Development Malaysia. The study is limited to projects approved for Sarawak State by the Ministry from January 2000 until April 2021. The methodology of the research is through qualitative methods research through collecting, analysing and integrating surveys data and semi structured in-depth interviews with stakeholders involved in the management of 50 projects identified from planning until construction of the development infrastructure.

The key assumption is that this mental awareness training module will be able to help young engineers to direct their brain in completing process more quickly, efficiently and effectively understand and process new information. Empathetic skill will allow engineers to gain full understanding on developing social skills and responsible behaviour for the LVRR program.

3 Research Methodology

The research methodology is divided into data collection and data analysis.

3.1 Data collection

Two types of data collection activities were carried out for this study: individual in-depth interviews and conceptualized empathy in the LVRR Design Guideline. In-depth interviews are to be conducted with

experienced engineers who had been involved in managing projects for more than six years and had been very well versed in designing project based on the LVRR standard guideline. Interviews are semi structured and worked to elicit detailed accounts of experiences related to understanding the local rural needs and social integration requirements and consideration in the planning part.

3.2 Data analysis

Conceptual analysis will be used for this research way by a concept choosing a concept for examination and the analysis involves quantifying and counting its presence. The main goal is to examine the occurrence of selected terms in the data collected. Terms may be explicit or implicit. Explicit terms are easy to identify. Coding of implicit terms is more complicated: the level of implication and will be based on judgments on subjectivity. Therefore, coding of implicit terms involves using a dictionary or contextual translation rules or both.

To begin a conceptual content analysis, first identify the research question and choose a sample or samples for analysis. Next, the text must be coded into manageable content categories. This is basically a process of selective reduction. By reducing the text to categories, the researcher can focus on and code for specific words or patterns that inform the research question (Hsieh F. et al, 2005).

4 Expected Finding

With the formative online competency module, young engineers involved in managing the LVRR program will be able to learn the competency of empathetic project managers and be trained to communicate and understand across different cultural and epistemic communities and became a professional excellence.

5 Significant of the Study

The developing of empathetic skill can improve young engineers' capabilities to communicate with others, to be part of a team, and to enhance leadership skills as empathy is an emotional skill that is built through understanding others and for further career success.

6 Conclusion

The online training module will help young engineers to build empathy to enhance their technical skill which can contribute to the increase of capabilities and as a solution to a widening gap of understanding between the engineering project management such as design and planning and the users need for a sustainable project management in the rural area.

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