The Role of Qualitative Research in Education 4.0: Reflections from a State-Funded Model-Building Qualitative Research

Jovito Jr. Anito [1] and Marie Paz Morales [2]

1José Rizal University – Philippines - jovito.anito@gmail.com
2Philippine Normal University –Philippines - morales.mpe@pnu.edu.ph

1 Abstract

The major shift in educational contour brought about by the Fourth Industrial Revolution (4IR) challenges every component of the traditional educational landscape (Morales, Anito, Avilla, Abulon, et al., 2019; Shahroom & Hussin, 2018; Chao, 2017). In higher education, the relevance of qualitative research in Education 4.0 is a significant point of interest. This paper primarily presents our reflection points after conducting a three-tier qualitative data analysis, which is a component of a state-funded research project (Morales, Anito, Avilla, Sarmiento, et al., 2019).

The research component described in this paper aimed at developing a pedagogical model of the current perspectives, ideals, and practices of Philippine Higher Education Institutions (HEIs) on Science, Technology, Engineering, Agri-Fisheries, and Mathematics (STEAM) Education. Likewise, this paper briefly describes the methodological rigors the we underwent in the development of the model. The developed model is also defined and elaborated in this paper to provide a context of the reflections. Our reflections mainly focus on the role of qualitative research in Philippine higher education as it deals with the possibilities, opportunities, and challenges of the 4IR.

These reflections were drawn both from the pedagogical model that we developed and from our experience in employing qualitative techniques in developing the model (Anito, Morales, Torres, Gonzales, & Ganeb, 2019). In this paper, we posit that qualitative research is highly relevant in Philippine higher education primarily because qualitative research develops and nurtures skills that are essential in the 4IR. These skills include sense-making, social intelligence, adaptive thinking, cognitive flexibility, and knowledge management. Sense-making refers to our ability to determine the underlying concepts and deeper meaning of what is being expressed by the research participants (Davies, Fidler, & Gorbis, 2011; World Economic Forum, 2018).

Sense-making is inherent in any qualitative research approach. On one hand, it entails having a mental dialogue with anything that appeals to our senses during data gathering, data encoding, and data analysis. On the other hand, it is demonstrating sensitivity to the implications of the analysis outcomes to the extant literature and the current and future social infrastructure. Sense-making is essential in the 4IR because it complements what the machines in the era of automation are not capable of doing. Apparently, sense-making is an ability that is unique to human beings thereby making it significant in a period where humans thrive with machines.

Qualitative research likewise advances social intelligence. Social intelligence is our ability to connect to other human beings in a deep, direct, and harmonious way (Davies, Fidler, & Gorbis, 2011; World Economic Forum, 2018; Bughin, et al., 2018; Xing & Marwala, 2017). It is a skill to sense reactions and stimulate the desired interactions. In qualitative research, social intelligence is best demonstrated during interviews, focus group discussions, and immersions. It is during these processes that we exhibit keenness to every action, emotion, word, and gesture of the people around us such that we tailor our own actions, emotions, words, and gestures to blend with theirs. Social intelligence is an

indispensable skill in the 4IR as workers need to collaborate and build relationships with people across social and cultural settings.

Like sense-making, social intelligence is another advantage of humans over machines which makes it relevant in the 4IR. Adaptive thinking is another skill that qualitative research builds among researchers. It is our ability to respond to unique and unexpected circumstances and to figure out solutions appropriate to emerging problems (Davies, Fidler, & Gorbis, 2011; World Economic Forum, 2018; Bughin, et al., 2018; Xing & Marwala, 2017).

The emergent nature of a qualitative investigation requires us to deal with serendipities across all stages of the research process thus inducing adaptive thinking skills. Adaptive thinking likewise pertains to our ability to deal with conceptual variations especially in addressing discrepancies between generated knowledge and existing social theories and constructs. The disruptive nature of the 4IR proffers uncertainties and randomness in all aspects of life thereby making the adaptive thinking skill essential. Qualitative research also nurtures cognitive flexibility (Xing & Marwala, 2017) and transdisciplinarity (Davies, Fidler, & Gorbis, 2011).

Qualitative research necessitates understanding of concepts across multiple disciplines such that researchers are able to think of multiple perspectives simultaneously during data collection and data analysis. This is demonstrated as our ability to analyze data with openness, especially those data that represent diverse epistemological and ontological groundings.

Consequently, this unravels every conceptual variation and discrepancy in the form of a conceptual model. While some qualitative approaches require us to suspend our conceptual prejudices in dealing with data, framing the data in a specific disciplinal context helped us in understanding the responses of our participants in our research. Cognitive flexibility is necessary in the 4IR. The seamless interaction of skills and opportunities requires graduates whose competencies represent an amalgamation of multiple perspectives. They are graduates who are able to speak languages of multiple disciplines. As experienced in our research, being able to converse in the language of a broader range of disciplines proved helpful in analyzing verbal data.

Knowledge management is another skill that is deemed relevant in the 4IR. Knowledge management, the ability to discriminate and categorize information, is fundamental in qualitative data analysis (Xing & Marwala, 2017; Davies, Fidler, & Gorbis, 2011). We discriminate information according to the conceptual demands of the emerging categories and themes and according to what is essential in building our thesis or model. At certain point in the study described in this paper, we encountered ideas that are important but are not relevant in our ongoing analysis. Hence, knowledge management is imperative. The upsurge of sophisticated information sources and knowledge exchange platforms in the 4IR results to a massive influx of data that we need to discriminate according to importance and relevance.

This makes knowledge management an essential skill in the 4IR. Qualitative research nurtures skills that are crucial to the economic, industrial, and social infrastructure in the 4IR. It deals with uncertainties and randomness which characterize the fourth industrial revolution. We argue that qualitative research is an essential component of Education 4.0, especially in Philippine higher education. Hence, integrating the principles and practices of qualitative research in Philippine higher education curricula, especially in STEAM, is deemed appropriate.

Keywords: qualitative research, Education 4.0, 4IR, STEAM Education, STEM Education, Philippines

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