Decision-making Framework in Times of Volatility, Uncertainty, Complexity and Ambiguity

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ABSTRACT

This conceptual paper proposes a theoretical decision-making framework tailored for educational leaders navigating the complexities of institutional management in the dynamic landscape of education. The framework delineates a continuum between objectivity and subjectivity, acknowledging the nuanced interplay between data-driven insights and personal discretion. Positioned along the objectivity-subjectivity spectrum, decision-making is contextualized within the volatile, uncertain, complex, and ambiguous (VUCA) environments prevalent in education. The discourse extends to the realms of big data and small data, elucidating their complementary roles in informing educational decisions. Big data, characterized by extensive datasets, aids in global policy formulation, while small data provides localized insights for day-to-day improvements. The interpretative facet emphasizes aligning data interpretation with overarching educational goals, recognizing the subjectivity introduced by stakeholder perspectives. In the Malaysian context, VUCA challenges, including policy discrepancies and the impact of the COVID-19 pandemic, highlight the imperative for educational leaders to adapt and make inclusive, well-informed decisions. This conceptual exploration advocates for a flexible decision-making model that harmonizes data-driven precision with context-sensitive, human-centric approaches, laying the foundation for future research and collaborative endeavours in educational decision-making.

INTRODUCTION

Decision-making is an essential aspect of human life, and individuals make decisions every day, ranging from personal decision to social, or professional decision that would bring wider impact. Decision-making is a process of selecting the most appropriate course of action from among several available options to achieve a desired outcome. It is a fundamental cognitive process that involves a range of factors such as perception, attention, memory, problem-solving, and reasoning. Decision-making can be described as the act of making a choice from alternatives or selecting a course of action that has the potential to lead to the desired outcome. According to Simon (1977), decision-making is the process of identifying and selecting a course of action to solve a specific problem, to achieve a goal, or to satisfy a particular set of objectives.

The importance of decision-making in various domains of life cannot be overstated. In fact, every mundane routine operation or major strategic move, requires swift and effective decision-making in the context of the fast-moving world today. The movement of industrial revolution, and globalization, has "flattened" the world (Friedman, 2014) and drastically increased global connectivity. Subsequently, the world presents itself as a world full of seemingly limitless options, a fitting phenomenon to the cliche "the sky's the limit." Amidst these options, decision-making becomes more demanding. Although decision-making is defined to be a cognitive process, there are times swift decisions made seem to represent one's intuition.

Like leadership, decision-making does not necessarily take a single definition or a single right formula. From the cognitive perspective, decision-making is a skill that can be mastered through training. It is a common observation that leaders' discretion is desired in the public service department in Malaysia. There are published circulars that encourage the use of leaders' discretion in decision-making (MOE, 1998; PSD, 1974). Subsequently, there is a need to further investigate the amount of discretion that would constitute an informed decision, something that is tangibly cognitive rather than intuitive. Or should there be a balance of both? If so, how does a leader balance them off?

This conceptual paper aims to discuss a viable theoretical decision-making framework that explains what could be achieved from the best of

both worlds. This decision-making framework seeks to conceptualize the amalgamate of objectivity and subjectivity involved in the process of decision-making. The discussion of this decision-making framework is confined to just education, specifically among educational leaders who manage institutional organizations. Educational leaders, in the context of this discussion, refer to school principals, or sometimes known as school heads, who are generally responsible for ensuring the success and well-being of their organizations, including students, staff, and other stakeholders. The following section discusses the decision-making framework with reference to the dichotomy of objectivity and subjectivity.

DECISION-MAKING FRAMEWORK

Decisions made in the world of education will see the employment of some forms of objectivity and subjectivity. The objectivity of decision making in education is mainly driven by data and numbers, or the compliance to educational policies and mandates. On the other hand, subjectivity in decision-making explains individual preferences, discretion, and attitude. Therefore, the composition of both objectivity and subjectivity in decision-making forms an objectivity-subjectivity spectrum of decision-making. School leaders move along this continuum based on different VUCA environments to arrive at optimal outcomes. Figure 1 shows the visual representation of this concept.

Figure 1
Visual representation of Decision-making conceptual framework
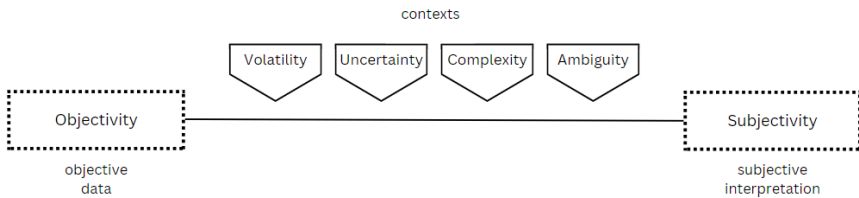
The discussion of objectivity in decision-making is generally found in data-driven decision-making literature in the domain of education management. These supporting models of decision-making are concerned with the employment of statistical analysis and the utilization of data for better decision. At this extreme end, it is decision-making based on data

alone. The discussion is usually empirical and does not deal with moralizing of how and why people make certain decision.

On the other hand, subjectivity decision-making is harder to capture with limited case studies or specific examples. It is the decision-making models that are driven mainly by preferences at the other extreme end of the spectrum. Most of the time, these preferences are confined to the social realities, such as culture, values and beliefs.

The objectivity-subjectivity spectrum is not a sequential spectrum. The objectivity or subjectivity of a decision made is not representational of any of the given stages in the process of decision-making. Rather, the spectrum should be referred to determine the ratio between the adoption of objectivity-subjectivity in making a particular decision based on existing environments. In the suggested framework, these existing environments are represented by various "context axioms". These context axioms identify themselves to the volatility, uncertainty, complexity, and ambiguity of current time in no order of preference.

The objectivity-subjectivity spectrum and the contexts of the conceptual framework are discussed in the following sections.

Objectivity-subjectivity spectrum

Classic objectivity literature assumes mathematical model as the core in the approach of operation research (OR) (Buchanan et al., 1998). This approach is distinctive with calculation and the attempt to quantify variables. For example, factors such as "change" and "risk" are presumably something that can be calculated and manipulated. In turn, the result helps researchers to compare and predict the outcomes of alternative decisions based on specific factors. With this approach, the decision maker's role becomes less significant, where decision can be generated based on better calculation.

Objectivity in decision-making is seen to be bound by the "functionalist paradigm" (Burrell & Morgan, 2019), a classic social theory mapping of existing objectivity-subjectivity theories that explain status quo of organizations, when translated into practice, assumes "hard, objective" organizations. It also means decision-making is identified to be an objective

process, supported by rationality (Borrero & Henao, 2017). Rationality can be translated into the use of analytical tools to facilitate better decision-making, for example popular analytical tools in education include strengths-weaknesses-opportunities-threats (SWOT), TOWS matrix derived from SWOT, plus-minus-interesting idea (PMI), Ishikawa fishbone (cause-effect analysis) and the like.

One of the fundamental elements in objectivity in decision-making is the utilization of "data". For decades, educational management, performance and improvement have relied on the utilization of data. It involves the simplest reorganization of numbers and statistics to the complete interpretation of quantified information and facts. Data analysis drives insights and aids in making informed decisions.

However, raw data in the form of quantified information and facts collect are meaningless numbers and figures if it is not injected with meaningful analysis and interpretation. The process of data analysis and interpretation involves the use of diversified analytical methods to review data and arrive at relevant conclusions. This includes categorizing, manipulating, summarizing the information to answer critical questions.

Furthermore, how these data should be, could be and ought to be processed is highly dependent on the nature and the goal of interpretation. Interestingly, the process of deciding the goal of interpretation and the utilization of data is highly subjective. Similarly, on the other extreme end of the spectrum is subjectivity in decision-making, which are not just hard figures and numbers but more "human" factors. At this extreme end, the decision maker matters. In fact, decision maker's preference, experience, skill, intention, intuition, discretion are all relevant factors that can sway a decision.

This also suggests that both objectivity and subjectivity in decision-making are not always mutually exclusive. They can be used interchangeably in different stages or different aspects when comes to decision-making. So much so that there might not be significant ratio between both objectivity-subjectivity in decision-making, but only varying contexts, purposes, situations, and environments that would determine the decision-making process. This in turn suggests a fluid and adaptable decision-making process. The intricate relationship between objectivity and

subjectivity in decision-making also advocates a context-driven approach to decision-making in education.

Data

In education settings, the use of data is not something new. In fact, there is a growing trend in the use of data sets to help educators in making better informed decisions about school improvement, student learning, professional development and the like. The use of data sets also addresses different gaps, providing relevant insights for the advancement of education. In essence, data is information in the form of facts, figures, or information that can be processed and analysed. By processing and analysing data, it is possible that insights, informed decisions, or reasoning is done better with the help of data. Data can often be found in the form of quantitative or qualitative, structured, or unstructured and can come from various sources. This concept paper discusses data based on their sizes and their uses.

Big Data

"Big data" has been a popular topic in education for years, mainly driven by the public discourse of IR4.0. "Big data" is frequently extracted from extensive and complex data sets generated from different educational activities and processes. As the term implies, the data sets involve is "big" in nature with huge volume beyond the capacity of conventional data processing methods. Over the years, "big data" is big based on the concept of three Vs – volume, velocity and variety (Laney, 2001). The three Vs characterized "big data" to involve massive amounts of data which is generated rapidly with a significant diversity of the types of data, for example, structured, unstructured, and semi-structured. Over time, the broader understanding of "big data" has evolved to include veracity and value (Manyika et al., 2011) proposed by various experts in the field.

The analysis of "big data" usually reveals trends and patterns which is in general useful in decision support and making prediction. In the field of education, the analysis of "big data" aids in charting educational policy, predicting learning outcomes or educational improvement. Some good examples of "big data" include standardized test scores, Sijil Pelajaran Malaysia (SPM), Trends in International Mathematics and Science Study (TIMSS), Programme for International Student Assessment (PISA) and others.

Small Data

While the discourse of "big data" has been around for decades, there is also a shift in the recent discussion where "small data" is considered to play an important role in education. The recent emerging discourse of "small data" also does not signify that "big data" is going to be substituted or that "small data" is a better alternative. In existing literature, it is always advocated that "big data" and "small data" would complement each other to help education in making better informed decisions (Maziva, 2018).

Although "big data" excels in large scale analysis, it falls short in offering indepth and contextual explanations which can be easily achieved through the analysis of "small data". If "big data" has been useful in educational decision-making at the global scale, then "small data" provides useful information for the improvement of day-to-day practices. The term "small data" is a term populated by Danish author Martin Lindstorm and Sahlberg (2016) agreed with the term definition that "small data" are meaningful "small clues that uncover huge trends".

The common understanding of "small data" is the size of data sets that are more manageable in terms of size and scope in comparison to "big data". "Small data" is usually specific, with narrower contexts and focused variables. In comparison, "small data" is also more contextualized over "big data" since it relates closely to immediate circumstances that generates the smaller datasets. The definition for "small data" is not always explicit like "big data". For example, Sahlberg and Hasak (2016) wrote that the "next big thing" in education would be the "small data" in education which acts as the "invisible fabric of schools", where the social capital (people) and their relationships with each other become important information for improvement.

To conclude, the utilization of data is inevitable for informed decision-making in education, especially in the aspect of school improvement and improved student outcomes (Schildkamp, 2019). Recent literature has expanded to include the discourse of "small data" to complement the popular discussion of "big data". The convergence of both data perspectives promised a more nuanced approach to better decision-making.

Interpretation

In this conceptual paper, the notion of objectivity in decision-making is discussed closely to different types of data and their usages. Data sets are obviously objective on their own due to their nature relevant to existing mathematical models and calculation. Data sets progress to be subjective when data users begin to manipulate factors, choose relevant analytical tools and inject meanings into the interpretation of data. This process represents the subjectivity end of the spectrum.

One of the most important considerations in data interpretation would be the data users' understanding of educational goals and stakeholders' perspectives. In general, decision-making in education is subjected to achieve an intended goal; be it to improve or to advance performance (Poortman & Schildkamp, 2016; Fernandes, 2023). Subsequently, the interpretation of data is solely dependent to how data can be aligned with and supports overarching educational goals. In turn, said data interpretation shapes viable strategies and practical tactical plans. On top of that, data interpretation could present different strategies and practical tactical plans based on varied perspectives of the stakeholders if there is no prior discussion on shared educational goals.

Data interpretation process is usually driven by different "needs" or "goals"; for example, continuous improvement to achieve a specific educational goal, charting the course to shape and create equitable educational policies, exploring patterns and trends for the next course of actions, making predictions or identifying past errors or mistakes to be avoided. The process is loaded with subjectivity since there are no hard cold facts involved but rather subjective paradigms of the decision-makers involved. It is the process where decision-makers are engaged in a "sense-making process" (Vanlommel et al., 2017). The process is not always straightforward and demands a lot of expertise, understanding and experience of the decision-makers toward the system for better interpretation. Since data may mean different things to different decision-makers, a decision cannot be made solely based on data and rationality. Datnow et al. (2017) mentioned that decision-makers' intuition may play an important role under the given circumstances.

Therefore, the discourse of data interpretation offers opportunities for the discussion of how data is interpreted by different stakeholders under the assumed common goals, or how does a decision-maker's expertise, understanding and experience of the system sway a specific educational decision. In addition, does decision-makers' expertise, understanding and experience of the system create bias (Tempelaar et al., 2020; Mandinach & Schildkamp, 2021) or vice versa. Most importantly, the influence of the immediate environment or educational contexts of a decision-maker is in, which is believed also to play a role in affecting an educational decision should be discussed. The following section discusses dynamic educational contexts in the time of VUCA.

Contexts

In the conceptual framework, objectivity-subjectivity of decision-making in education is bound by the immediate contexts of the time. This is explained through the concept of VUCA (volatility, uncertainty, complexity, ambiguity). First off, the world of education is a readily dynamic and ever-changing environment. It is even more so in this era marked by unprecedented global connectivity and constant transformation. Some of the characterized changes and transformations in education include rapid technological advancements, demographic shifts, and changes in societal values and norms. School leaders are expected to navigate complex and unpredictable situations that can have far-reaching implications for their organizations (Rumeli et al., 2023; Shamsudin, 2019; Nordin et al., 2021).

Traditionally, a school leader may have to decide alone on the allocation of resources to different departments or decide on disciplinary measures for students. In such cases, the said school leader is solely responsible for the decision, which can lead to a greater impact or implication for the organization. This requires a capable school leader, with strong leadership skills to make swift and effective decisions that would bring significant influence upon others. It is a representation of a more authoritarian decision making where the rise and fall of an educational institution is shouldered by an individual alone. Over the years, such apartheid practice has evolved. In existing literature on educational transformation, a bottom-up approach in organization management is favoured for effective change. The paradigm shift sees the rise of shared

responsibility and collaborative work among a team; and decisions are made by highly motivated and committed team members who have been empowered with trust.

Educational transformation also has been focusing on the discussion of "empowerment" in recent years, where school leaders are expected to exhibit a high level of self-awareness with the encouragement of the involvement of school staff in decision making and the emphasis on the importance of staff participation in the process. This shift is partly due to the impact of evolving human rights and the increase in unionization (Clegg et al., 2021). Nowadays, there is more democracy at work, and the human rights movement advocates equality and equity (Crawford & Lepine, 2013). There is also more legislative awareness among workers, which makes them demand more justification for decisions that are made. In addition, the improved organization of unions brings direct impact in terms of the exertion of considerable influence, which is not dominated by organizational leaders alone now. As a result, leaders are finding themselves under pressure to adjust, accept and adapt to the diminishing authority they once enjoyed (Clegg et al., 2021).

In Malaysia, this shift from authoritative leadership towards a more participative leadership poses crucial questions that leaders must consider. For example, leaders need to decide when they should consult their staff, what matters they should consult their staff on, and how much staff decision-making they should allow. Decision-making in an educational institution is not often a clear-cut process, and different leadership styles can be aligned with different decision-making styles to maximize outcomes. Therefore, it is crucial for leaders to choose the right decision-making style for a given situation.

Moreover, the emerging theme of loose coupling between bureaucratic and authoritarian leadership styles within an educational organization has made decision-making styles more complex (Maassen & Stensaker, 2019). In this regard, leaders must learn to adapt their leadership style and decision-making processes to ensure the best outcomes for their organization. The ability to be flexible and adapt to the changing environment is crucial for leaders in Malaysian education. By doing so, leaders can effectively navigate the challenges of decision-making in the education sector.

Furthermore, making effective decisions in the VUCA environment also means that educational leaders must be aware of the different decision-making styles, considering their own leadership styles which would help educational leaders to develop strategies for making effective decisions in a timely manner. This may involve gathering relevant information, engaging stakeholders in the decision-making process, considering multiple perspectives, and using data-driven approaches to inform decision-making. It may also involve developing contingency plans and being flexible in response to changing circumstances. Effective decision-making in educational leadership is critical to the success of educational organizations and the well-being of students and other stakeholders. By developing strong decision-making skills and strategies, educational leaders can navigate the challenges of the VUCA environment and ensure that their organizations thrive in the face of uncertainty and change.

In Malaysia, educational leaders are presented with an array of contexts where swift and smart decisions must be made. On top of that, educators are facing numerous challenges arising due to various factors, including evolving educational landscapes, technological advancements, and even geopolitical factors.

For example, the Malaysian government has often been accused of intense turnabout in the aspect of educational decisions and policies, causing immense uncertainty, ambiguity and often confusion among educators (Malay Mail, 2013; Malaysia Kini, 2009; The Straits Times, 2021). One of the more obvious examples is the language policy, where an ongoing struggle between prioritizing the National language - Malay language and the international language - English language is presented.

Not to mention the COVID-19 pandemic that has brought unprecedented challenges to the world, including the education sector. In Malaysia, the pandemic has caused significant disruptions to the education system, affecting students, teachers, parents, and all stakeholders. It also brought along a lot of uncertainty. Additionally, the pandemic has forced policymakers to re-evaluate existing education policies and systems, with potential long-term impacts on the future of education in Malaysia.

The emergence of new technologies also brings pedagogical impacts, especially in the way how educators deliver their

lessons. Educators have to consider the available resources and the utilization of different devices, consoles to make a lesson successful. Lesson preparation has to take into consideration buffering time and technicality issues. For example, the shift of the role of an educator to truly facilitate individualized and self-paced learning (Qureshi et al., 2021) or the use of alternative assessment such as point systems, leaderboards, badges, progress bars instead of the traditional pen and paper tests (Hanafiah et al., 2019).

Other VUCA situations include discrepancies between the federal government and state government in educational related policy and mandate. In terms of decision making, all these happen at the very top of the hierarchical structure and there is hardly any inclusion of the stakeholders who are directly impacted by these policies and mandates. School leaders would need to understand thoroughly what the expected outcomes are and align the expectations of both the federal and state government. As for educators and students, there would be possible issues when they moved out of the state and began to work in other states that run different policies and mandates. Students would need to seek a matching school environment as the policies and mandates last for the full cycle of their 13 years education in Malaysia.

The study of decision-making in education has a growing urge due to the sophistication in managing risks brought about by changes, understanding human behaviour form maximum outcomes and the advancing of technology that supports, mimics, or even replaces cognitive processes in educational institutions. Decisions made in education brings impact and shapes a nation where the fundamental role of education is for the development of human capital. The dynamic educational landscape in times of VUCA calls for the search of a resilient and flexible decision-making model.

CONCLUSION

In conclusion, this conceptual paper explores a theoretical decision-making framework tailored for educational leaders managing institutional organizations. Decision-making in education, particularly in the dimension of school leadership, is a multifaceted process influenced by a dynamic

interplay between objectivity and subjectivity. The conceptual framework presented here envisions decision-making along the objectivity-subjectivity spectrum, acknowledging the importance of both data-driven, objective analysis and the subjective, contextual interpretation led by educational leaders.

The framework posits that the context of decision-making, often characterized by volatility, uncertainty, complexity, and ambiguity (VUCA), serves as a crucial determinant in shaping the balance between objectivity and subjectivity. As educational leaders navigate the intricacies of VUCA environments, they must judiciously employ data-driven insights (objectivity) while embracing the nuances of personal discretion, preferences, and contextual understanding (subjectivity).

The discussion also includes the perspective of "big data" and "small data" with an emphasis on their roles in education. Big data, characterized by vast and complex datasets, offers insights at a macroscopic level, aiding in policy formulation and predictive analyses. Conversely, small data, with its more focused and contextual nature, provides meaningful clues for day-to-day improvements, highlighting the symbiotic relationship between the two.

The interpretative aspect of decision-making in education is dissected, emphasizing the critical role of aligning data interpretation with overarching educational goals. Stakeholder perspectives, individual expertise, and the "sense-making process" of decision-makers contribute to the subjectivity inherent in the interpretation of data. The paper underscores the need for a nuanced understanding of educational contexts, acknowledging the shifts in leadership styles and the democratization of decision-making processes.

In the Malaysian educational landscape, the VUCA challenges are exemplified by policy discrepancies, technological disruptions, and the overarching impact of the COVID-19 pandemic. Educational leaders are tasked with adapting to evolving scenarios, ensuring that decisions are inclusive, well-informed, and align with the varied expectations of stakeholders.

In essence, decision-making in education is a complex dance between the empirical and the human, the objective and the subjective. The fluidity of this process requires educational leaders to be agile, adaptive, and capable of striking a harmonious balance between data-driven insights and context-sensitive, human-centric approaches. As education moves forward, the need for a resilient and flexible decision-making model becomes imperative in shaping the future of learning and development.

This conceptual exploration lays the groundwork for further research and dialogue on decision-making in education, encouraging educators, policymakers, and researchers to collaborate in developing and refining models that meet the evolving needs of educational institutions in an ever-changing world.

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CONFLICT OF INTEREST

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