

# Principle Concepts in Futures Studies: A Narrative Review

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Received 2024 July 18; Accepted 2024 September 03.

## Abstract

**Context:** Our world is characterized by a dynamic landscape of variations, complexities, uncertainties, and ambiguities (VUCA). These elements manifest in various domains, including politics, economics, communication, information, science, and research, all of which significantly impact our lives. It is crucial for policymakers and managers to adopt a forward-thinking approach to comprehend these VUCA elements and their implications for the future. The future will undoubtedly differ from the present and the past. However, humans possess an inherent desire to understand and anticipate the future, particularly in the face of uncertainty. Therefore, exploring and understanding the future is not just a curiosity, but a necessity. Futures Studies can serve as a valuable tool in this context, enabling us to efficiently leverage opportunities and resources to navigate the chaotic environment. Review studies play a pivotal role in this process by reviewing existing work and synthesizing knowledge in a specific field. This study aims to collate findings related to the key concepts of Futures Research, thereby contributing to our collective understanding and preparation for the future.

**Keywords:** Futures Studies; Futures; Uncertainty; Futures Research; Futurism; Futurology

## 1. Context

Understanding the future is of utmost importance and necessity (1). The fascination of humanity with the discovery of the future has always been evident (2, 3). Our world is distinctly defined by the four attributes of volatility, uncertainty, complexity, and ambiguity (VUCA), necessitating further exploration. Global management, given these characteristics, typically involves forecasting future scenarios and aligning them with future needs and objectives (4). Futures Studies, initially used in the twentieth century primarily for military research (5, 6), have since expanded into various fields such as psychology, politics, economics, culture, social sciences, and even personal life (7). While future-oriented thinking has always been a part of human history, it was only in the 20th century that Futures Studies, grounded in sociology and policy sciences, began to take a scientific form. By the 1960s, futures studies had gained widespread acceptance as an academic discipline and had a clear presence in the global scientific community. This era saw the establishment of many leading global federations and respected scientific journals. Educational programs at the Doctoral and Master's level in futures studies were also introduced during this time. In the following years, the discourse shifted towards addressing global issues, and futures

studies became a crucial part of strategic planning (8).

These studies are necessarily multidisciplinary or transdisciplinary and can influence all sciences and fields (2, 7, 9). Futures studies is both a scientific and artistic discipline, heavily reliant on creativity and imagination to envision various potential futures. Its primary objective is to unravel and comprehend the intricate web of causality through conceptual thinking, a systems-oriented approach, and feedback mechanisms (10). Futures studies is a methodical examination of potential, likely, and desirable futures, along with the underlying beliefs and myths associated with each. Over the past half-century, the focus of these studies has shifted from merely predicting or forecasting the future to charting different possibilities, shaping preferred outcomes, and occasionally anticipating emergent phenomena. This involves embracing newness, uncertainty, complexity, and emergence at both the collective societal level and the individual personal level (11). This understanding ultimately fosters innovation in societal and technological domains (12, 13). Also, these studies are completely based on the discourses, values, and beliefs of societies (14) and are of particular importance for progress and development (12). Review studies play a pivotal role in this process by reviewing existing



work and synthesizing knowledge in a specific field. This study aims to collate findings related to the key concepts of futures research, thereby contributing to our collective understanding and preparation for the future.

## 2. Methods

Narrative reviews are a form of knowledge consolidation that is rooted in a unique research tradition. They are frequently characterized as non-systematic, suggesting a hierarchy of evidence that positions narrative reviews beneath other forms of reviews. However, narrative reviews are extremely beneficial to medical educators and researchers. While a systematic review typically concentrates on a specific question within a particular context, using a predetermined method to amalgamate findings from similar studies, a narrative review has the flexibility to encompass a broad range of studies and offer a comprehensive summary, complete with interpretation and critique. Various types of narrative reviews exist, including state-of-the-art, critical, and integrative reviews, to name a few (15). There are no established standards or protocols that guide the review process. While reviewers will gain knowledge about the problem, they will not achieve a thorough understanding of the scientific status quo related to the problem (16).

The procedure for conducting a narrative literature review can be divided into four steps: Step 1: Execute a search: Narrative reviews, unlike systematic reviews, typically do not have a specific research question or a defined search strategy. However, the inclusion of a search narrative, which details the decision-making process in formulating a literature search strategy, can enhance transparency in literature searching. This could potentially improve the peer review process of literature searches and foster more engagement and discussion among stakeholders, experts, and users of research. While a clear search strategy is not strictly necessary for narrative reviews, it can improve the review's comprehensibility and reproducibility. Despite not requiring a predefined search strategy, a narrative review still requires a thoughtful and comprehensive examination of the literature (15-17). Hence, in this study, we conducted an unrestricted search using relevant keywords across multiple databases, including PubMed, Scopus, and Web of Science, without adhering to a specific strategy. We also performed a free search with the same keywords on Google. In our research, we meticulously reviewed a variety of reliable sources. This included not only articles and books but also the websites of reputable organizations; step 2: Determine keywords: When authors publish their research, they highlight several keywords so that others can locate their work during database searches. Once a relevant article is found, use its keywords and similar ones in your search. To locate individual studies on related topics, the keywords used when they were indexed must be used. It may be necessary to try several

keywords before finding a paper that is relevant to your review question. In our research, we employed a variety of keywords including futures studies, futures research, futurism, futurology, approach, technique, methodology, design, theory, model, framework, and so on, to locate resources pertinent to the objectives of our study; step 3: Evaluate abstracts and articles: Once the search is completed and all duplicates are discarded, the abstracts of the remaining articles should be reviewed to ensure they address your review question. For narrative reviews, it is not necessary to include every article on a subject. In our research, we did not import the search results into any reference manager. Instead, we reviewed them directly on the web pages. Our process initially involved checking the titles. If a title seemed relevant to our study's objectives, we proceeded to screen its abstract in a new tab. If the abstract was relevant, we then screened the full text. Any material that aligned with our study's purpose after this thorough examination was incorporated into our final study; step 4: Record results: Summarize and synthesize the findings from the articles you have discovered, and incorporate them into your writing as needed. Once the final studies were identified, we extracted the pertinent data from each. Given that the information related to our study's objectives was primarily textual—comprising statements, letters, and words—we employed content analysis for its examination. Consequently, we merged any content that shared similar meanings or concepts. Onwuegbuzie and Frels (pp 24-25, 2016) categorize narrative reviews into four main types (18): (1) general literature review: This review provides an overview of the key aspects of a topic, serving as the introduction to a thesis or dissertation, guided by the research objective or hypothesis; (2) theoretical literature review: This type of review investigates how theories shape or influence research; (3) methodological literature review: This review describes the research methods and design, highlighting their strengths and weaknesses, and suggesting future research directions; (4) historical literature review: This review examines the evolution of a topic over time, aiming to contextualize research historically and identify potential future research directions. Given this categorization, it can be stated that our work falls under the type of general literature review.

## 3. Main Text

### 3.1. The Importance of Futures Studies

Futurologists consistently discuss multiple futures, asserting that there are various futures, not just a single future (19). They emphasize the optimal utilization of resources (20). These studies significantly differ from other research studies, particularly in the two factors of "Time" and "Uncertainty" (21). The timeframe in futures studies extends beyond 5 years and can even reach up to 1000 years or more (14). These studies are applied when the

level of uncertainty in the subjects under consideration is profound and impactful, and the variables of the drivers and key factors are not easily identifiable (21). Such uncertainties lead to greater complexity in understanding the future, as there is limited information available about their effects (22). Consequently, there is a need for a methodology that can provide systematic knowledge and systems thinking about the future (21). To gain a deeper understanding of the topics discussed, the following paragraphs will present a general overview of the fundamental and principled concepts in futures studies.

### 3.2. Methods and Approaches of Futures Studies

Like other fields of study, futures studies employ a systematic methodology to achieve their goals, with the selection of suitable methods for data collection and information analysis being a key step (3, 14). Emphasis is placed on the use of a combination of different methods to gain a deeper understanding, with an average of at least five methods being combined (23, 24). The Popper study is one such study that emphasizes the combination and use of different methods. According to the world's most prestigious futures studies centers, United Nations Industrial Development Organization (UNIDO) and European Foresight Monitoring Network (EFMN), the Gordon and Popper Models have the highest validity and acceptance compared to other methodological categories (25, 26). The Gordon Model, also referred to as the dividend discount model, is a financial evaluation method that calculates the inherent worth of a stock based on a future series of dividends that grow at a steady rate. While it's predominantly used in financial studies, its principles of predicting future values based on present data can be

applied to futures studies. In futures studies, the Popper Model refers to Karl Popper's three-world theory. World 1 encompasses physical entities, world 2 embodies the realm of subjective cognitive acts and processes, and world 3 constitutes the world of intelligibles, objective knowledge that is written and stored. This Model offers a framework for comprehending the various dimensions of future scenarios. It's crucial to acknowledge that these models are utilized in different contexts and have diverse applications. The Gordon model is more quantitative and financially oriented, while the Popper model is more philosophical and conceptual, offering a framework for understanding and analyzing future scenarios. Of course, the Popper model, in terms of the quantity and variety of methods, is more popular and comprehensive (26). On the other hand, some of these studies adopt an exploratory approach, seeking to explore the Futures, while others adopt a normative approach, aiming to understand the Futures (27). The Normative Approach focuses on Values and Norms, answering questions such as: What Future do we want? What is desirable for us? (27). Another approach is the exploratory approach, which typically seeks answers to questions like: What other possible Futures are there? What could happen? (27). To further understand these studies, basic concepts such as the futures cone, future assumptions and goals, futures components, and finally, terms used in this research methodology will be described in the following sections.

### 3.3. Futures Cone

Futurists in Futures Studies typically consider four types of Futures, referred to as the Futures Cone (28-30). Each of these Futures is described below (Figure 1).

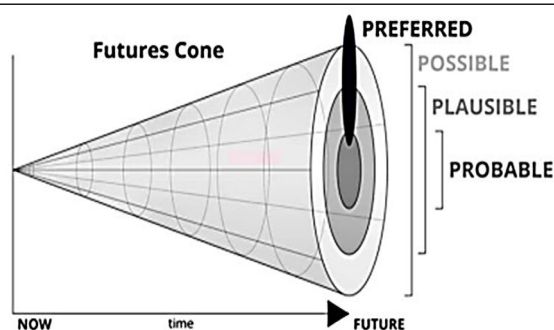


Figure 1. Futures cone; older model (29).

(1) Possible futures: These futures represent the broadest scenario where anything can happen. They are based on imagination and may not align with the knowledge and science of the present time (14, 31).

(2) Plausible futures: These futures align with current scientific principles and are considered plausible. They are not imaginary or fictional for us (31, 32).

(3) Probable futures: These futures are more likely to occur than possible and plausible futures and are focused

on the near future. Forecasts often rely on and emphasize probable futures, considering them as part of these futures (31, 32).

(4) Preferable futures: This future is one that we seek to discover based on its desirability to us. They are motivational and subjective, and not necessarily realistic or objective (31, 33).

It's important to note that possible futures encompass all kinds of futures, plausible futures are a subset of pos-

sible futures, and probable futures are a part of plausible futures. However, preferable futures form a subset of the common set of all of them (28).

In the newer versions of the futures cone, they are depicted with more detail (Figure 2).

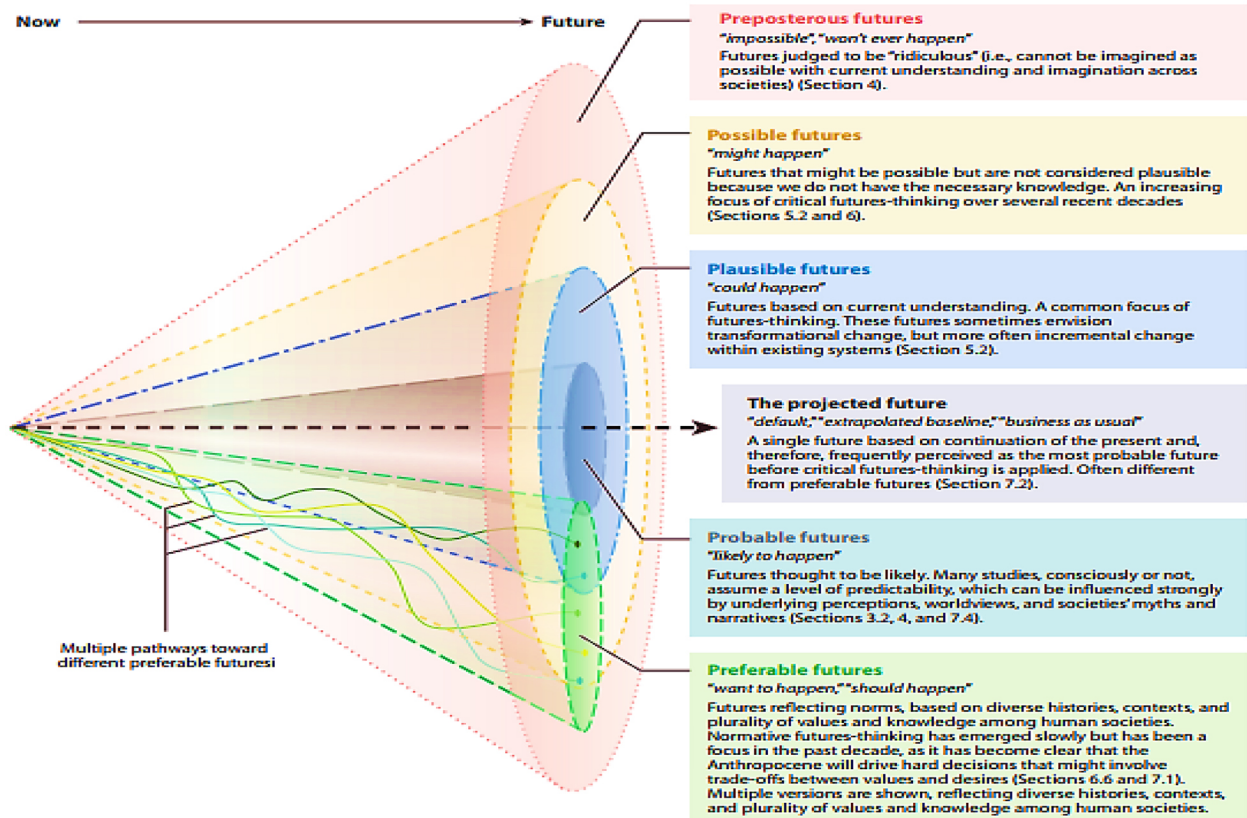


Figure 2. Futures cone; new version (34).

Additionally, two other types of futures are mentioned. (5) Preposterous futures: These are the futures that we deem to be 'ridiculous', 'impossible', or that will 'never' happen, yet they could be useful to explore.

(6) Projected futures: This refers to the (singular) default, business-as-usual, 'baseline', extrapolated 'continuation of the past through the present' future. It could also be considered as being 'the most probable' (or most expected) among the probable futures (35).

### 3.4. Futures Assumptions

Futures studies encompass several assumptions, some of which are as follows:

- Time is continuous, linear, unidirectional, and irreversible.
- The future is unique; in other words, events that occur in the future are not necessarily caused by past or present events.
- The future is essential for the application of human relations, meaning that the future is shaped by human actions.
- The most valuable knowledge is information about the future. Success cannot be achieved without under-

standing changes and complexities.

- The future is invisible; in other words, there are no definitive statements about the future, and our knowledge of the future is based on assumptions.
- The future is filled with uncertainty and complexity, implying that events are not certain and can change.
- Understanding the future requires systematic and holistic thinking that reveals how factors interact and confront each other.
- There is a focus on supporting a specific image of the future to build social momentum (2, 7, 36-38).
- Each scenario is substantially different from the others.
- The focus is on long-term futures with different time horizons.
- There is a commitment to multiple interpretations of reality.
- The approach is very action-oriented.
- There is a focus on understanding different methodologies.
- There is more concern with the futures process.
- Futures studies is as much an academic field as it is a participatory social movement (14).

### 3.5. The Objectives of Futures Studies (7)

- Study of possible and probable futures.
- Study and review of future images, and promotion and support of a specific image.
- Study of ethical and cognitive foundations of futuristic studies.
- Interpretation of the past and determination of the current situation.
- Combining different knowledge and norms using public participation to create a social movement and support Social Action.

### 3.6. Components of the Future

One of the most crucial steps in understanding the future is to identify its components, answering the question, “What elements and components does the future consist of?” (39). In this context, James Dator proposes that the future is a combination of four components: Trends, events, images, and actions (28, 38, 40). Events are occurrences that rely on historical discontinuity (39). They occur non-periodically and instantly, and there is no historical record or data of them (28, 41). In contrast, trends emphasize historical connections and appear

when phenomena have an information history (28, 41, 42). They actually have a recurring and periodic nature (28). Images, another component of the future, include images of dreams and hopes that people develop in their minds (27, 41, 43). Studying these images to understand the future of nations can be very helpful. The last component of the study is the action component, which encompasses all functions and activities based on mental images, and involves planning and providing solutions to achieve the desired future (27, 43). It should be noted that these four components do not carry the same weight, and each has its own complexities (27, 41, 43).

### 3.7. Levels of Uncertainty

According to certain studies, the level of uncertainty exists on a spectrum that includes two extremes: Complete certainty and complete uncertainty, with four intermediate levels. Level one uncertainty pertains to a deterministic future and has the lowest level of uncertainty. Level four, on the other hand, has the highest level of uncertainty and is based on possible futures. Level two uncertainty is based on probable futures, and level three uncertainty is based on plausible futures (Figure 3) (35, 44).


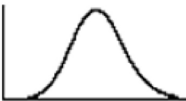
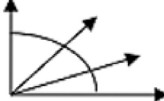
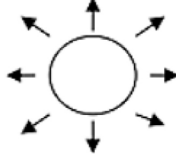
		LEVEL				Total Uncertainty
		Level 1	Level 2	Level 3	Level 4	
LOCATION	Context	A clear enough future 	Alternate futures (with probabilities) 	A multiplicity of plausible futures 	An unknown future 	Complete Certainty
	System model	A single (deterministic) system model	A single (stochastic) system model	Several system models, with different structures	Unknown system model; know we don't know	
	System outcomes	A point estimate for each outcome	A confidence interval for each outcome	A known range of outcomes	Unknown outcomes; know we don't know	
	Weights on outcomes	A single set of weights	Several sets of weights, with a probability attached to each set	A known range of weights	Unknown weights; know we don't know	

Figure 3. Levels of uncertainty (35).

### 3.8. The Futures Triangle

The futures triangle is a simple methodology that illustrates three competing factors: Future pull, present-time pressure, and the weight of the past (45). Each of the three dimensions of the futures triangle provides a framework for careful exploration:

- (1) Preferred future and pull of the future: This involves exploring what motivates us to move towards the future we desire and/or exploring the future we want to avoid.
- (2) Weights of the past: This involves investigating our pasts that have shaped who we are, how we behave or act, what we do, or why we did what we did. These reasons

could be socio-economic systems, such as family culture and traditions, customs within our community, jobs and work that people do, war and conflict, environmental issues, government and legal systems, religion, and many others. Sometimes the weights of the past could be something positive that gives strength to us to strive for alternative futures.

(3) Push of the present: This involves scrutinizing the impacts and consequences of trends and emerging issues as forces of change that are affecting our lives now and are pushing us into some kind of future. By analyzing the impacts and consequences of those forces of change, we ‘see’ a better picture of what lies ahead. Is that the future

we want? The answer to this question ties back to the pull of the future—a motivation or an avoidance (46).

The futures triangle provides an anchor for understanding how the three facets of the future influence the way we imagine possibilities and infer meaning from the interplay of hindsight, insight, and foresight. As a tool for building foresight capacity, it increases the capability to map, make sense, and connect the drivers of change among three time horizons (47).

By analyzing the interaction of these three forces, the futures triangle (Figure 4) assists us in developing a plausible future.

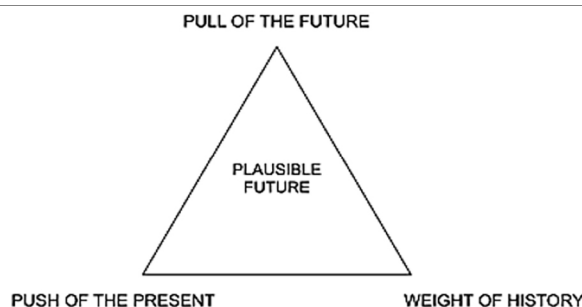


Figure 4. The futures triangle (48).

Indeed, a new model known as the future triangle 2.0 has recently been introduced. This model integrates the primary method with improved scenario planning by visually representing scenarios against the three dimensions of the triangle: Stretching, pushing, and weighing. The insights from the future triangle 2.0 encourage a deliberate and systematic discussion of the three dimensions of the future triangle in each scenario, and whether

the scenarios differ in these characteristics (49).

### 3.9. Definitions of Terms Used in Futures Studies

Futures studies is a relatively new and emerging field that has not yet spanned a century, so researchers need to familiarize themselves with some of the most important terms used in this field of research. The definitions of some of these terms are as follows (Table 1).

Table 1. Definitions of Terms Used in Futures Studies

Term	Definition
<b>Futures studies</b>	The term “futures” is used instead of “future” because futures studies discuss multiple futures, while the term “future” focuses on a single future (50). These studies are process-oriented and use a systematic, structured, and participatory process to understand and explore different futures (48, 51). They emphasize achieving the desired future (52, 53), and to reach this future, it is necessary to create a suitable vision and horizon (54). We must work to solve the failures and problems of reaching such a future (47). There are several definitions of futures studies, all of which have common points such as: Emphasis on the scientific nature of futurism, improving and shaping the future, emphasis on identifying and discovering the future, division of future types, and the art of discovering the future (28).
<b>Driving force</b>	These are a set of key factors and future-shaping forces that shape and change the story of scenarios (55). These propellants also affect trends, events, images, and actions (56). These forces determine the effects of variables on each other (55). Ultimately, they are of great importance in shaping the future (57).

<b>Uncertainty</b>	Uncertainty refers to unknown factors that have not yet occurred, and it is very difficult to predict the probability of their occurrence (58). The future is fraught with uncertainty due to the very high speed of change, and the faster the change, the less likely it is to predict the long-term future (59). In general, it refers to factors that are of great importance, but their predictability in the future is very low. These factors are known as the logic and axis of scenarios that form the basis of the story of the scenarios (60).
<b>Weak signals</b>	Weak signals include early warnings from emerging topics, which can give us clues to possible events, trends, and surprises in the future (61).
<b>Wild cards</b>	These are events with a low probability of occurrence and high impact that occur quickly and have important consequences (62).
<b>Foresight</b>	Foresight is a systematic process that requires systemic thinking and broad participation and is more focused on long-term futures. It is usually applied in the areas of knowledge, technology, economics, environment, and society (58, 63). Futurism emphasizes the two elements of stakeholder participation and planning, in other words, focusing on these elements makes it different from other futuristic studies (20, 59).
<b>Scenario</b>	Scenarios are narratives of the future that are formed to make decisions in situations with high uncertainty and numerous complexities. These stories explain the different paths to different futures (40, 54, 64). These stories include a series of causal events and their interactions that describe spaces of the future (65, 66). Finally, scenario writing makes organizations more flexible and creative in the face of the future (67).
<b>Extrapolation</b>	Extrapolation includes statistical forecasts using historical trends that predict a specific time period in the future (68).

#### 4. Conclusions

Futures studies is a multidimensional field that explores various potential futures, not just a single predetermined one. It acknowledges the inherent uncertainty and complexity of the future, requiring a systematic methodology and a deep understanding of key concepts. The field employs different methods and models, such as the Gordon and Popper models, each with unique applications. Futures studies adopts either an exploratory or normative approach, focusing on aspects like values, norms, or possible scenarios. It investigates different types of futures, from the broadest possibilities to more likely or desirable outcomes, including possible, plausible, probable, and preferable futures.

The field operates on key assumptions such as the continuity and irreversibility of time, the uniqueness of the future, and the influence of human actions in shaping future outcomes. The objectives include studying possible and probable futures, promoting specific future images, interpreting the past, and determining the present situation. Futures Studies also involves understanding various components of the future—trends, events, images, and actions—each playing a unique role in shaping our comprehension of what lies ahead.

The future triangle is a valuable tool in this field, examining the interplay between the future, the past, and the present. It aids in developing a plausible future by mapping and connecting the drivers of change across different time horizons. Overall, Futures studies play a crucial role in helping us navigate the uncertainties of the future and make informed decisions for a desirable outcome. The future Triangle, a significant tool in this field, maps and connects the drivers of change across different time horizons, aiding in the development of plausible future scenarios. The Future Triangle 2.0 further enriches this methodology by visually representing scenarios against the three dimensions of the triangle. Futures studies highlight the importance of considering multiple dimensions and their interactions in understanding and planning for the future.

Key terms include Futures studies, driving force, uncertainty, weak signals, wild cards, foresight, scenario, and extrapolation. Future studies could focus on the following areas for further exploration and development:

- Further refinement of models such as the Gordon and Popper models, exploring their unique applications in various contexts.
- Detailed examination of the exploratory and norma-

tive approaches, and how these can be integrated for a more comprehensive understanding of the future.

- Investigation of the underlying assumptions of Futures studies, such as the continuity and irreversibility of time, the uniqueness of the future, and the role of human actions.

- In-depth study of the components of the future—trends, events, images, and actions—and how they interact to shape our understanding.

- Enhancement of tools like the future triangle and future triangle 2.0, and exploration of how these tools can develop plausible future scenarios.

- Examination of the role of futures studies in decision-making processes, and how it can be used to navigate future uncertainties and plan for a desirable future.

- Exploration of key terms such as driving force, uncertainty, weak signals, wild cards, foresight, scenario, and extrapolation, and their implications for the field.

**Authors' Contribution:** All authors listed have significantly contributed to this article's development and writing.

**Conflict of Interests:** There is no conflict of interest.

**Data Reproducibility:** The dataset presented in the study is available on request from the corresponding author during submission or after publication.

**Funding/Support:** This research received no funding or financial support.

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