



Article

Reflections on the Usefulness of Scenarios

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Abstract

This article explores the reflections of PhD students from the Scenario Planning in Education course at Tamkang University, focusing on the Higher Education in Taiwan 2050 project. This project, developed as an action-learning exercise, aimed to answer the question: "How might higher education in Taiwan evolve over the next 27 years?" The students critically analysed two foundational papers—Graham Molitor's Scenarios: Worth the Effort and Sohail Inayatullah's Questioning Scenarios—and applied their insights to scenario development. Through their reflections, they highlighted how scenarios foster deeper understanding, challenge assumptions, and encourage adaptive thinking. The article integrates these reflections to demonstrate how scenario planning can support university leaders in transcending deterministic thinking, engaging with uncertainty, and envisioning transformative futures. It highlights the potential of this methodology to help Tamkang University transcend outdated assumptions, embrace uncertainty, and embed foresight into strategic decision-making as it approaches its centennial.

Keywords

Scenarios, Educational Futures, Alternative Futures, Strategic Foresight, Organisational Transformation

Introduction

This article presents the reflections of a group of PhD students from the Scenario Planning in Education course taught at Tamkang University in September 2023. The primary project for the course was Higher Education in Taiwan 2050; an action learning for scenario development with a focal question "How might higher education in Taiwan develop over the next 27 years?" The year 2050 marks the 100th anniversary of Tamkang University. As part of the course, students were tasked with critically analysing two key papers—Scenarios: Worth the Effort (Molitor, 2009) and Questioning Scenarios (Inayatullah, 2009). These papers, chosen from the Scenario Symposium published by the Journal of Futures Studies (Vol13(3), 2009), provided a foundational starting point for their exploration. After completing their analysis, they reflected on how their scenario development experience deepened their understanding of the concepts presented in these readings.

The article begins with the commentaries and reflections from five students, presented here in the following order, namely Shakil Ahmed, Po-Ta Chen, YiLin Lee, Kai-jie Tang and Edward Niedbalski. Building on the students' commentaries, I (the course instructor) integrate their insights to demonstrate how university leaders and administrators can effectively utilise scenarios for planning; and conclude with a statement to justify the usefulness of scenarios highlights their role in helping leaders transcend outdated assumptions, embrace uncertainty, and develop adaptive strategies for long-term transformation.

If We Can Dream Together, We Can Work Together - Shakil Ahmed

It just happened to be the statement (if we can dream together, we can work together) is on my business card and in many ways, this has been my personal experience so far with futures thinking, that the opportunity for collaboration

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in the room increases due to futures methodologies, including scenario planning. Inayatullah (2008) does allude to Galtung's transcend method (1998) where two groups who may have conflicting visions of the future can work together to generate win-win solutions. In a win-win scenario, both groups are left inspired to act.

Scenarios to me are narratives about the future, which Molitor (2009) admits to when he acknowledges that scenarios are shared through storytelling. I do believe in general that narratives and stories can shape how people think and act in the present, which is an essence of Casual Layered Analysis (Inayatullah, 1998). The question is, can narratives about the future change the way people think and act in the present?

In his article, Molitor (2009) highlights whether scenario planning is useful at all, since it seems to be mired in statements and assumptions about the present.

I agree with Inayatullah (2009) that methods, such as scenario development, should not be in isolation and increasingly, I do wonder whether just reading a report on scenarios is sufficient for change. This is what Molitor (2009) criticises about scenarios when he points out that scenarios presented to leadership may be regarded as "paper bluster". Pedagogically, such an approach is not engaging - it is just one-way and by no means social constructivist, i.e., enabling the construction of knowledge through social interaction.

From a social constructivist perspective, the process of those who have been involved in the scenario development definitely experience various advantages - but I'm not sure just listening to a one-way presentation on scenarios is enough - it has to be followed by some kind of reflection and sense-making - and even enabling the listener to participate in further scenario development. Thus, there is a difference between the act of developing scenarios and reading scenarios that have been developed by others.

It seems that the act of developing scenarios may carry more merit in developing foresight, as mentioned by both Wilkinson and Curry (Inayatullah, 2009, p.76). However, it is not sufficient that scenarios are used to develop just strategic foresight, in which case, such foresight may just be performative. That foresight must be transformative in nature - and thus, the process of scenario development should be both about the external and internal world. It is easy to develop scenarios about the external world, but more difficult to have a conversation about the organisation or individual internally. An introspective approach does require a level of bravery to be authentic and vulnerable, but ultimately can result in a process that mobilises trust among groups involved in the scenario development process. Thus, the way that scenarios are developed will make a difference.

I personally do not think that scenarios have to be scientifically true, scenarios are essentially provocations to think about different questions and aspects about the future. Molitor (2009) while he may have contributed to the field of futures thinking, does seem to carry certain weights of the past, in assuming that futures studies is about prediction and data should come from experts. I believe that progressive views in the field would not box futures studies as either the science or art of prediction (Sardar, 2010) - if anything, it may be the science and art of helping individuals and groups have more influence and agency over the future - being able to predict accurately does not have to be a condition for influence and agency. Inayatullah (2009) champions the use of scenario development in creating the preferred future in the pursuit of more agency.

Futures thinking may increase the likelihood of a particular future - but it also enables you to be nimble and adaptive as the present and future plays out, which is also echoed by Hiltunen (Inayatullah, 2009). Like a ninja or karate student, you prepare yourself in a certain way so that irrespective of what happens you are prepared. Futures thinking helps you to prepare yourself for the uncertainties in the future. Ninja and karate skills can keep you healthy - a preferred future - but also prepare you with tools and tactics to both defend and attack, if necessary. Thus, maybe in my next version of the business card, I may consider changing it to "If we can dream together, we can ninja together." Maybe 'futures ninja' could be a metaphor for futures praxis (reflection and action).

In that spirit, scenario planning is just one of the tactics of the futures ninja. Go, futures ninja, go!

It's Not About the Destination, But the Journey - Po-ta Chen

After examining the differing perspectives on scenario analysis presented by Molitor and Inayatullah, it becomes clear that each utilises the methodology distinctively. Molitor adopts a data-driven approach, relying heavily on historical trends to inform robust future forecasts. His method aligns closely with concrete strategic frameworks and decision-making processes, thereby augmenting the practical applicability of scenario analysis. Conversely, Inayatullah integrates creative thinking and deep cultural and psychological insights, underscoring the influence of

diverse narratives and belief systems on future imaginations. He advocates for the use of complex methodologies to explore a variety of potential future scenarios, thereby enriching the depth and breadth of scenario analysis.

As Inayatullah (2013) asserts, "Scenarios are the tool par excellence of Futures Studies. They open up the present, contour the range of uncertainty, reduce risk, offer alternatives, create more flexible organisational mindsets, and even predict" (p.54). This approach suggests that combining scenario analysis with other futures methodologies, such as the Futures Triangle and Causal Layered Analysis (CLA), can enhance the comprehensive understanding and exploration of the future.

Also, Milojevic and Inayatullah (2015) state that: "Unlike the empirical approach of futures studies, which sees narratives (qua data) as accurate and a precise description of an objective reality, narrative foresight, in the tradition of interpretive, critical and poststructural futures studies, sees reality as constantly negotiated by stakeholders"(p.152), which corresponds with the previous paragraph.

The S-curve model (Molitor, 2003) is particularly relevant when considering the structured and predictive nature of his approach to scenario analysis. The S-curve illustrates how innovations and societal changes typically follow a predictable path from slow initial adoption, through rapid growth, to eventual saturation and decline. Molitor's emphasis on historical data and trend analysis allows for a more grounded, empirically-based forecast of future developments. For example, when applying the S-curve to technological adoption, Molitor demonstrates how strategic decisions can be better timed by understanding where a technology or trend currently sits on the curve. This method is crucial for organisations seeking to minimise risks and maximise opportunities by aligning their strategies with well-established patterns of change.

In contrast, the Futures Triangle and Causal Layered Analysis (CLA) (Inayatullah, 2008) shifts the focus from prediction to transformation. The Futures Triangle, with its dimensions of pushes of the present, pulls of the future, and the weight of history, offers a comprehensive framework for exploring the dynamic interplay of forces shaping the future. CLA, on the other hand, delves deeper into the layers of meaning and narrative that underpin scenarios, revealing the myths and metaphors that drive societal change. Inayatullah's approach not only broadens the scope of scenario analysis but also enriches it by incorporating multiple perspectives, allowing for a more nuanced and transformational exploration of possible futures.

Integrating these methodologies highlights the inherent tension between Molitor's data-driven, forecast-based approach and Inayatullah's more fluid, narrative-based exploration of the future. While the S-curve provides a valuable tool for understanding and leveraging historical trends, the Futures Triangle and Causal Layered Analysis emphasise on the need to challenge existing paradigms and envision alternative futures that are not constrained by the past. By combining these approaches, scenario analysis can benefit from both the precision of empirical forecasting and the creativity of transformational futures thinking.

Addressing the uncertainties and complexities of the future necessitates a creative yet focused depiction of what may lie ahead. As Cilliers (2005) notes, creativity should not merely be regarded as indulging in flights of fancy; rather, it should involve a careful and responsible cultivation of the imagination, aimed at developing a better and more diverse set of future possibilities.

Practical applications of imaginative and creative approaches are exemplified in projects such as the "Camden Imagines" initiative. Moral imagination, a form of activism driven by creativity, seeks to address and reimagine societal challenges by envisioning better futures. This concept was applied in the collaboration between Moral Imaginations and Camden Council, which notably enhanced the psychological safety and imaginative capacities of its participants, demonstrating the successful integration of creative thinking into municipal governance and underscoring the importance of imagination as a critical skill in modern civil service (Tickell, 2023).

Reading Molitor's critical perspective on scenario planning has opened a new dimension of thought for me regarding the uses of this methodology. I believe that both perspectives are valid, differing mainly in their focus. Molitor contends that scenario planning rarely provides new insights, emphasising the effectiveness of traditional forecasting and historical analysis. In contrast, Inayatullah acknowledges the limitations but stresses the theoretical and practical advancements, highlighting how scenario planning can transform thinking and create preferred futures. One focuses on the inherent value of the method itself, while the other examines the impact and reflection following its application. Discussing the methodology from these differing angles contributes to its advancement and refinement.

One challenge I have encountered in my learning process is recognising my own patterns in conducting scenario analysis. Many researchers versed in futures studies are familiar with scenario analysis literature and methodologies. However, applying these in organisational, team, or personal contexts often reveals difficulties in identifying one's habitual patterns. This step requires a heightened level of 'awareness' or 'consciousness.' Reflecting on Molitor and Inayatullah's perspectives, I observed my inclination to focus on subsequent changes or preventative measures after understanding scenarios, rather than on the direct forecasts derived from the analysis itself. This viewpoint aligns with Inayatullah's discussions, whereas Molitor underscores the challenges of implementing scenario planning, which demands knowledgeable participants and meticulous preparation. The facilitator's role is crucial, as their guidance can dismantle existing metaphors and frameworks, unveiling new possibilities.

Revisiting these articles after self-reflection, it is evident that the positioning of scenario analysis must be clear and dependent on the desired outcomes. If the goal is to achieve precise forecasts of future developments, the analysis must be supported by extensive historical data and statistics. Conversely, if the aim is to explore diverse, bold, and wildcard-like unexpected events, combining scenario analysis with other futures methods can reveal deeper values or metaphors and identify hidden driving forces.

The future is not a static endpoint to be predicted, but a dynamic landscape to be shaped through intentional and informed action. The contrasting approaches of Molitor and Inayatullah highlight the multifaceted nature of scenario analysis, showing that both empirical rigour and creative exploration are necessary for a comprehensive understanding of future possibilities. Molitor's reliance on historical data provides a solid foundation for strategic planning, yet it is Inayatullah's integration of narrative and cultural insights that invites us to transcend existing paradigms and envision transformative futures. By synthesising these methodologies, we can engage in scenario planning that not only forecasts likely outcomes but also challenges the status quo, creating pathways to preferred futures.

As we move forward, the field of Futures Studies must embrace both the precision of data-driven analysis and the transformative potential of imaginative foresight. This dual approach enables us to navigate the uncertainties of the future with greater clarity and adaptability, ensuring that scenario analysis remains a vital tool for organisations, communities, and policymakers alike. The journey of scenario planning is one of continual learning and adaptation, where the objective is not merely to predict the future but to actively participate in its creation. Through this process, we can unlock new opportunities, mitigate risks, and ultimately contribute to a future that is not only possible but desirable.

Is Scenario Planning Worth Learning? - YiLin Lee

In Molitor's article, the most convincing argument to me is that "scenario output is basically limited to input quality." This emphasises the critical need to gather stakeholders, domain experts, and qualified participants who are willing to engage openly in diversified discussions. However, this requirement poses a significant challenge for traditional Chinese enterprises, where hierarchical structures and conservative mindsets often hinder open dialogue. In such environments, the experience and skills of the facilitator become crucial. Thus, conducting scenario analysis for strategic foresight planning within a traditional Chinese company is likely to be challenging.

In contrast, Inayatullah's statement highlights the comprehensive perspective offered by scenario planning. This method provides insights into desirable futures by encompassing multiple aspects of time and cognition. For example, in the Taiwan Higher Education 2050 Project, we established a time framework, analysed significant historical events, and categorised and clustered hits, aligning with Molitor's suggestions (p. 87). Using CLA, we analysed systemic and deeper structural issues for a better understanding of the way things are. Both futurists' contributions significantly enhanced our study. Although my experience with workshop participation is limited, no other approach offers such detailed analysis and in-depth discussions, making it an invaluable learning experience.

I'd like to share a key episode from this learning journey. Kai-jie and I were responsible for interviewing school leadership and decision-makers. Surprisingly, both the chairman and the academic vice president participated enthusiastically. The interviews went smoothly, and they openly shared many observations and perspectives. However, a mature student expressed scepticism about our research topic, citing a similar project conducted by the graduate school of Futures Studies for Tamkang University in 2015. "Despite involving school management, deans, and professors, the lack of feedback and review mechanisms rendered that project ineffective," said the interviewee.

This revelation prompted us to re-think our current project. Is it worth the time and effort?

We then raised this issue in class, hoping to get help to make the project “work”. We then realised that it would be unrealistic to assume that our scenario project serves as a panacea or a one-size-fits-all solution to the complex challenges facing the university. Rather, it offers a structured framework to enhance decision-making by anticipating uncertainty, broadening perspectives, identifying emerging opportunities and risks, improving the resilience of strategies, aligning short-term actions with long-term goals, and fostering collaboration and dialogue among stakeholders. This approach equips decision-makers with the tools to navigate potential futures with greater flexibility and insight, ensuring more informed and adaptive responses to unforeseen developments.

Upon completing the four scenario narratives for Taiwan Campus 2050, we developed a chronological storyline, identified emerging issues, and inferred implications at the first, second, and third levels, considering their short, medium, and long-term impacts. Personas were created to illustrate how individuals' lives would differ across various scenarios. Inspired by these vivid descriptions of personas, I think the scenario narratives are what really works to help and inspire stakeholders to understand the potential impacts of each scenario. Then I realised that change must come from the stakeholders' insight rather than foresight. As Inayatullah concluded, quoting Andrew Curry, "Scenarios should be our challenge, as practitioners, to turn that foresight into insight" (p.76).

Molitor's opinion that the primary motivation for scenarios is to gain a deeper comprehension of "uncertainty" is echoed here (p. 90). The importance of understanding the implications of scenarios is emphasised through the process. Meaningful transformation begins with stakeholders' internal reflections and dialogues prompted by these implications. Inayatullah's notion of the inner process of scenarios (p. 79) highlights that while creating scenarios might be straightforward, true foresight lies in using them to stimulate internal discussions and proactive thinking, thereby moving toward a desirable future.

Beyond the course project, I would like to highlight my work and research in new energy solutions, which aligns with my academic and professional interests. The IEA's (International Energy Agency) 2050 net-zero strategy can be a good example to explore and examine the views of Molitor and Inayatullah on scenarios and how they are reflected in the IEA's scenario analysis. Five points emerged from the analysis: a) participants from diverse backgrounds; b) using scenarios to explore possibilities and uncertainty; c) learning is built into the scenario building process; d) scenarios help us prepare better for uncertainty; and e) inclusiveness and dialogue.

Firstly, the experts participating in the IEA scenario analysis were from diverse fields, eliminating Molitor's concern of "Garbage in, Garbage out."

Secondly, considering different technological, economic, and policy developments, exploring various futures, four scenarios are presented by IEA: NZE (Net-Zero Emission), SDS (Sustainable Development Scenario), APS (Announced Pledges Scenario), and STEPS (Stated Policies Scenario). Fig 1 presents the amount of carbon emissions of each scenario. Molitor highlighted the value of scenario analysis in understanding change and uncertainty, while Inayatullah focused on using scenarios to explore multiple future possibilities, with both stressing the importance of engaging with potential future developments. “Alternative scenarios developed can be likened to roadmaps for assisting the selection of a better path into the future (Molitor, p.85)”. The roadmap and selection of a desirable future provide stakeholders with insights for change, aligning with Inayatullah's reference to Andrew Curry's assertion that “scenarios should be our challenges, as practitioners, to turn that foresight into insight” (p. 76).

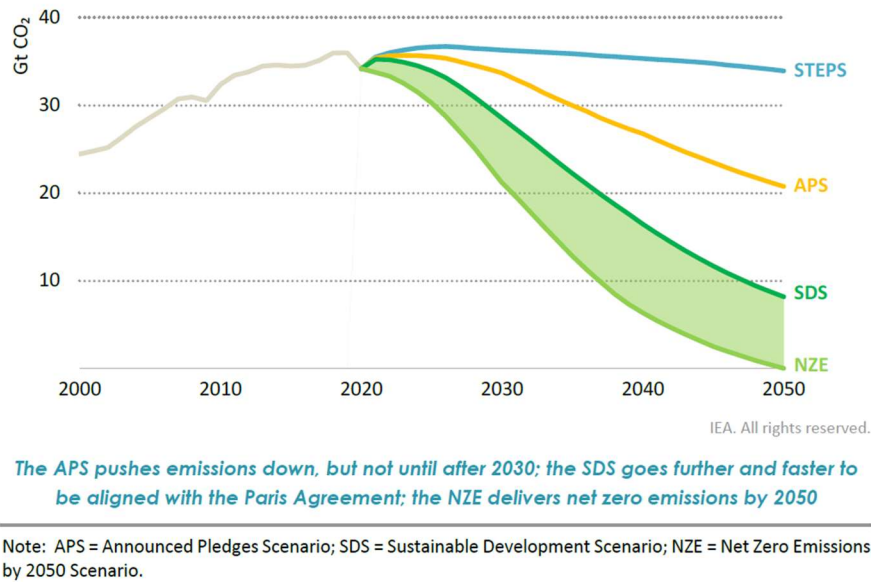


Fig. 1: CO2 emissions for each IEA scenario (IEA, 2021)

Thirdly, the IEA points out that achieving the net-zero goal within the next 20 years requires not only new technologies but also significant innovation (IEA, 2023). Due to the rapidly growing demand for clean energy, the time/process from laboratory to commercial operation has been greatly shortened. The continuous breakthroughs in nuclear energy and hydrogen energy technologies are obvious examples. For stakeholders, all steps involved are action learning. As Inayatullah quoted Roubelat, “he concludes that scenarios are worth doing provided that action learning/planning is built into the process and not as something that is done late” (p. 75). Yet Molitor also pointed out that “scenario deliberations inherently entail learning. All things considered, strategic conversations can be as much a learning process as a problem solving device” (p.75). Both consider that scenarios provide learning experiences for stakeholders, and I think Inayatullah places more emphasis on action learning and active adaptation.

Fourthly, the IEA scenarios challenge existing assumptions about energy production and consumption. For example, they emphasise the need for large-scale deployment of clean energy technologies and changes in energy investment. The complexity and uncertainty are unavoidable, as Molitor quoted Pierre Wack’s scenarios “The operative inducement for scenarios involves more fully understanding ‘uncertainty’” (p.90). Yet I think there’s more. As new technologies and innovations emerge, our overall worldview on climate, environment, and society is constantly changing. In addition, interruptions may also play an important role, such as Covid and AI. Take AI as an example, since the advent of ChatGPT in 2022, the energy consumption of data centres has increased significantly. Using ChatGPT for a query conversation consumes ten times more power than using the Google search engine for a general search (Goldman Sachs, 2024). The power consumption of images generated using ChatGPT can fully charge a mobile phone (Heikkillä, 2023; Tangermann, 2023). Google's greenhouse gas emissions jumped nearly 50 percent in five years, due to its artificial intelligence data centre (Figure 2 below; Baranuik, 2024). Microsoft’s emissions also jumped almost 30% as it raced to meet AI demand (Figure 3 below; Financial Times, 2024). However, it is obvious that we can no longer live without AI, and the new technologies have changed our worldview. Similarly, Roubelat also points out that "scenario planning must not only use methodologies that bring in the worldviews of different stakeholders but examine how these worldviews move through time." Although AI increases power demand, AI can be applied in energy management such as optimising energy efficiency and enhancing grid control. Using AI to manage energy consumption and reduce carbon emissions have made AI and energy the more powerful couple (IEA, 2023). I consider the flexibility enhanced by scenario process (quoted by Inayatullah of Wilber’s integral theory, p. 76), and the flexibility and innovativeness brought by scenarios (quoted by Inayatullah of Hiltunen, p. 78) would help us prepare better to different worldviews through time.

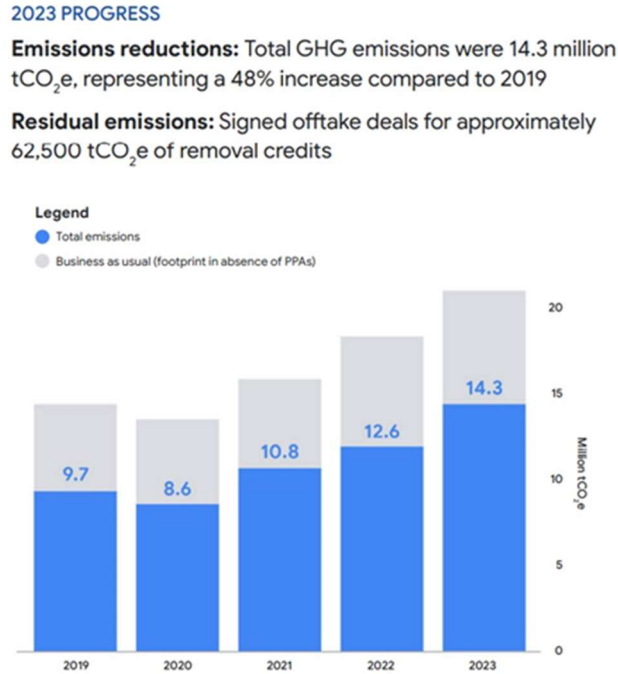


Fig. 2: Google total carbon emissions from 2019 to 2023 (Google, 2024: 31)

Carbon Table 2—Tracking progress toward carbon negative by 2030

Microsoft's overall emissions increased by 29.1% in FY23, in relation to our base year. Additionally, we retired 605,354 metrics tons of carbon removal as part of achieving our annual target to be carbon neutral.

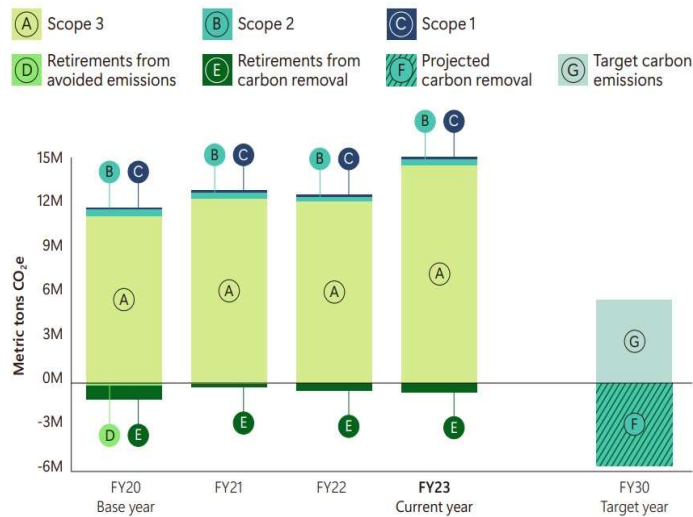


Fig. 3: Total carbon emissions of Microsoft from 2020 to 2023 (Microsoft, 2024: 13)

Finally inclusiveness and dialogue: The IEA's scenario planning involves a wide range of stakeholders, including governments, industries, and the public, to create a comprehensive and inclusive strategy for achieving net-zero

emissions. Molitor illustrates the importance of strategic conversation for decision making (p.84). Moreover, Inayatullah quoted Wilbert's integral theory (p.76), "Hayward and Morrow consider that their approach works best when organisations wish to explore the interplay between the external environment and the actors who live in that environment. This interplay can lead to breakthroughs." Net-zero is a daunting project, and because there are so many and diverse stakeholders, the process requires inclusiveness and dialogue, which aligns with Inayatullah's emphasis on incorporating diverse perspectives and promoting dialogue.

This learning journey helped me realise that the value of scenario planning means more than the creation of scenarios but in the reflections during the process of engaging with them, which drives meaningful change. For climate change, I hope this holds true.

Can Differences in Positions Be Reconciled? Developing Assessment Methods May Be a Way Forward - Kai-jie Tang

In the two assigned readings, Graham Molitor questions the effectiveness of the scenario method, while Sohail Inayatullah and other participating scholars in the symposium tend to support the effectiveness of the scenario method.

In my view, this debate reflects the differences in positions between two kinds of futurists. Molitor represents futurists who emphasise quantitative trend forecasting, with the effectiveness he highlights focusing on whether it can provide practical value for decision-making and problem-solving. In contrast, Inayatullah (and many other participating scholars) prioritise the value of the scenario method in action learning and organisational learning (referred to by Molitor as "secondary benefits").

After reading the content of the two articles, I believe this debate deepens our understanding of the scenario method and raises two important unresolved questions.

1) Whether and How Future-Oriented Organisational Learning Can Be Achieved?

Based on the content of the two articles, we classify the potential effects of the scenario method into three types:

1. Generating clear, actionable strategic roadmaps that support organisational decision-making and problem-solving (practical value);
2. Offering participants engaging and unexpected experiences (entertainment value), which may arise from stimulating intellectual challenges, stepping beyond everyday perspectives (a journey into the future), or the facilitator's charisma;
3. Promoting long-term transformation within organisations and individuals by embedding futures thinking into organisational processes.

From my personal experience, the actual outcomes often only achieve the second type of effect among the three mentioned. During the workshop, participants mostly experience fresh and interesting surprises and engage in thinking outside their routine. However, a few days after the workshop, upon reviewing the outcomes, they may find them unremarkable. Molitor argues that there is a lack of evidence supporting the scenario method's ability to achieve the first type of effect but acknowledges the second type. In contrast, Inayatullah (and many other participating scholars) do not advocate for the scenario method to provide the first type of effect and respond to Molitor's skepticism by emphasising the value of the third type of effect. In practical cases, we can observe how Inayatullah strives to implement his ideas. For example, Inayatullah (2020) presents future education scenarios for countries such as Australia, Malaysia, and China, reflecting a reflection of the status quo and a narrative shift, embodying Inayatullah's emphasis on double loop learning and narrative learning. However, Inayatullah's descriptions of learning often manifest as an immediate "Aha!" moment of realisation (e.g., Inayatullah, 2024), which raises questions about whether such insights can truly foster long-term organisational learning and transformation. Achieving long-term transformation can be difficult and may require durable involvement from futurists, rather than through just a few scenario workshops. I believe that if we want to reach a preliminary conclusion in this debate, then we need not only further development of methods to achieve long-term changes through scenarios, but also accumulate empirical evidence of actual long-term effects of scenario methods. Otherwise, Molitor's criticism will continue to hold validity.

II) Regarding the Measurement Standards for Output Quality and Long-Term Transformation Effects

To evaluate the effectiveness of scenario methods, a comprehensive set of evaluation criteria or indicators is essential. Since futures studies are not about prediction, the quality of outputs cannot be assessed based on the accuracy of predictions. Notably, several futurists have attempted to establish evaluation methods for scenario quality. For example, Chermack (2007) proposes six dimensions—Design, Story, Symphony, Empathy, Play, and Meaning—to evaluate scenarios. For each dimension, specific criteria are provided (for example, under the Story dimension, criteria include relevance, challenge, and plausibility). Additionally, Dhami et al. (2022) proposed five evaluation criteria: completeness, relevance, plausibility, coherence, and order effects. However, these evaluation methods primarily focus on the immediate outputs of scenarios and less on the long-term impacts of the scenario method. In light of Inayatullah's emphasis on double loop learning, we might consider drawing on Chris Argyris's (1977, 1991) analysis of double loop learning within organisations to develop evaluation criteria for the long-term effects of the scenario method. Such criteria could include whether participants become aware of their own defensive reasoning, and whether the process leads to changes in the organisation's learning system.

Furthermore, as pointed out by Molitor, many factors such as pre-existing data preparation, the level of expertise of participants, and the skills of facilitators can affect the effectiveness of the scenario method. Therefore, evaluating whether the method itself is effective (or worth doing) under multiple influencing factors is also an important issue.

Considering these various aspects, I believe that developing a comprehensive set of quality evaluation indicators, encompassing pre-data preparation, scenario outputs, and long-term impacts, could be a crucial first step in reconciling differences among futurists.

Upon completing the 2050 Taiwan Higher Education Scenario Project, I believe we can adopt a more optimistic view of the effectiveness of the scenario method. Firstly, this project involved several high-level leaders from the higher education system. Based on their feedback, we learned that these leaders are usually preoccupied with current affairs and rarely have the opportunity to consider the distant future. Participating in the scenario project allowed them to think about the future of higher education in 2050, thereby providing a chance to shift their mindset. Compared to the more straightforward plan-execute-achieve approach, this method of broadly disseminating and accumulating possibilities is more likely to bring about substantial social change.

Secondly, participants in the scenario project gained various types of thinking training. Since the scenarios covered societal, institutional, and individual (through using persona method) levels, participants became accustomed to thinking across different levels, from individual to macro, and imagining the interactions between these levels, thus enabling them to see both the forest and the trees. Additionally, through the use of the Chronological Map, participants enhanced their ability to perform multi-level causal reasoning.

Last but not least, while the scenario method alone may not directly produce strategies and action plans, we did gain many insights and implications from the scenario experience, which will aid in subsequent strategy formulation (as Inayatullah suggests, in combination with other methods). Overall, regarding the scenario method, the key might not lie in achieving actionable strategies through a one-time effort (though valuable implications can still be obtained), but rather in enhancing various thinking skills through repeated and regular practice.

Scenarios: The Real Deal for Building Positive Futures? - Edward Niedbalski

My background and previous education and toolkit as with an MA in cultural Anthropology very much places me as a 'boots on the ground' type of thinker, focusing on practical outcomes and the 'Down to Earth' (in alignment with Molitor's self-characterization) perspectives, hopes, desires, and current and future needs of real people, rather than the often abstract, 'head in the clouds' thinking to which Futurists and futures methodology are prone. Thus, I would have a natural tendency and inclination to agree with Molitor's 'Down to Earth' viewpoints. Scenarios can, from one perspective, be rightly criticised for having an abstract, disjointed and unrooted focus on the purely/highly speculative and hypothetical, that can appear to be cognitively dissonant from current realities and lived experience. The entertainment value derived from 'Telling a good story' as the central element of scenario planning is certainly nothing new, as Molitor notes with historical examples; the (degree-less) 'foresight practitioner' being the current version of the Kublai Khan's 'court astrologer', with renamed, repackaged, and over-simplified methodologies based on the work of actual academics, which is often as little more than what he refers to as "new wine in the same old bottle". Nonetheless, the entertaining nature of the thought exercise can plant the seeds of potential future change

in the human mind, which is ultimately where any possibilities for true, transformative change must first take root.

It is of little surprise that Molitor notes that in his fifty years in the field, that in the government and corporate worlds, scenarios have typically amounted to little more than “paper bluster” and represent a mostly performative “parlor game” which simply reinforces the status quo of business as usual thinking, which most of these organisations and management folks prefer. It is very much in those organisations and specifically their embedded leadership and shareholders (to be distinguished from ‘stakeholders’) interests to maintain that business (and profits) as usual status quo, with scenario analysis being a co-opted tool to either maintain– or return to– that ‘profits as usual’ arrangement. Potentially transformative scenarios often receive little attention and find difficulty gaining traction, not only because they appear necessarily ‘ridiculous’ as Dator’s Second Law of the Futures (2006) holds to the embedded interests of those they are presented to, but because the epistemology, the groundwork, and the ‘road map’ towards those futures are often (intentionally) disregarded by those with the power and ability to implement meaningful change, specifically due to their potentially transformative nature.

Futures studies and futures thinking are great for seeing ‘the long road’, ‘the distant (possible) future(s)’, and the seemingly impossible and implausible possibilities the future holds. A ‘taking the long way’ approach is certainly advocated by Molitor (2009) in his assertion that “dialogue among experts leads to different perspectives and better output than dialogue among fools” (p.86). It is understandable and necessary on some level that there be a certain amount of ‘expertise’ in a gathered room of ‘experts’, if anything truly useful is expected to take place. But it– and at least some of its (semi/un)skilled and (un)credentialed practitioners– are often not particularly good at advising individuals nor organisations on how to take the grounded, real world first steps to designing and building the tunnels through/under nor the bridges over the chasms between the now and the ‘maybe in the future(s)’. I find myself in strong agreement with Burke’s viewpoint, quoted by Inayatullah (2009), that “scenarios are not about forecasting or even alternatives but about having deeper, more effective conversations about world’s we wish to create (p.79-80).” Far too much of scenario thinking and analysis present findings which come across as disconnected from lived realities in the present, and the hopes that regular people hold for their futures. Burke’s (2009, p.101) view that the real value in the process of creating and discussing scenarios is that it opens a space for creativity aimed at taking realistic steps towards creating preferred futures is key for how scenario analysis can be ‘worth the effort’ (p.99). Inayatullah sees the value in the creation of the mental space to have a different conversation in the first place, which has to precede any hope or efforts at formulating and later enacting any tangible changes for the future. I can also agree that this has to be the bedrock upon which new possibilities must be built, but ‘building’ the foundations without plans or ‘blueprints’ for what to build, how to build it and why, or how to reach those goals will find it particularly difficult to become anything more than the “paper bluster” that Molitor discussed.

It is in this hypothetical space, even if seemingly detached and abstract at first glance and sometimes/often lacking practical approaches for taking first steps, where the real value of using scenarios can be found. The need for context-based use and development of scenarios with stakeholders (and less ‘shareholders’) of all kinds, regardless of the project, has the real need of creating along with that far off gaze towards ‘distant futures’ the pathways– or at least the means for creating those pathways– which will reduce or remove the assumption of implausibility which the abstract, detached nature of some scenarios often present. If we imagine the path towards transformation as a journey as Inayatullah and Sweeney (2020) do, we can say that “transformative foresight... is opening a space where we all learn and transform with each other. This is less the Hero’s journey than the collective caravan” (p.29). While Dator’s Second Law of the Future pertaining to the need for anything useful about the future necessarily at first appearing ridiculous, it should also increasingly become a part of the role of the Futurist to create and provide the ‘tools and building materials’ to construct the roads and bridges for our collective caravan to travel and transverse the long, hard, broken pathways between the present and those seemingly distant and unreachable ridiculous futures. Because it is within the processes of building functional and diverse ‘tool kits’ of futures methodologies that the journey towards those futures that they gradually become less ridiculous, eventually more plausible, and later, a ubiquitous part of present reality in transformative futures. Richard Slaughter (2006) has stated that:

“Futurists and foresight practitioners need access to these new tools, perspectives and capacities. Like any other tool kit, they are not the whole picture. They too will change, develop and be replaced over time with others. Yet even at this early stage they bestow potent new gifts upon this domain and its hard-

pressed practitioners: depth insight, practical wisdom and a durable foundation for productive work” (p.19).

It is in this narrow space between acknowledging the often abstract, head-in-the-clouds nature, uses of, and thinking behind scenario analysis and the matter-of-fact realities and expectations put upon and expected from the corporate boardroom (or the university president’s office) that the imaginative and reflexive approaches brought to use from the ‘toolkits’ of Futurists can meet the practical needs of the real world. Projects such as Taiwan Higher Education 2050, a project undertaken by Tamkang University’s own Department of Education and Futures Design PhD students, can hopefully find amongst its interviewees and participants a receptive audience. It is easy to understand and empathise with university leadership that it essentially ‘has a university (business) to run’. Education institutions, particularly a ‘private’ university such as Tamkang University, are perhaps beholden and answerable to a wider variety of stakeholders than a ‘public’ university is. Students, parents, alumni, external funding organisations, and the immovable monolith that is the Taiwanese Ministry of Education set the parameters, expectations, and goals that determine– and ultimately limit– the potential actions and potentially transformative and necessary changes that university leadership could make now and in possible future(s).

These numerous and externally imposed expectations likely create a ‘tunnel vision’ effect, a reinforcement of the boundaries of ‘Business as usual’ scenarios, which function as self-imposed guard rails on the road to the future, making it seem like there is only ONE, singular, ‘possible future’. The current direction and focus of the institution create conditions which inherently limit the amount of ‘wiggle room’ needed to truly be open to imagine real, meaningful change. It is the hope of the Higher Education 2050 project that through the use of narratives woven together and illuminated by the use of scenario analysis and personas that the narrow spaces between inherently limiting external expectations imposed from the outside and the inside knowledge contained within the vast knowledge and significant experience of university leadership can find the space to imagine new directions and new, preferred futures for Tamkang university and Taiwan.

Discussion and Conclusion (Written by Nur Anisah Abdullah, Course Instructor)

The value of scenario planning lies not in precise forecasts or detailed plans but in the exploration of diverse perspectives, narratives, and uncertainties. This approach fosters learning, teamwork, and reflection, encouraging flexible thinking and shared insights. However, leaders at Tamkang University sometimes expect scenarios to yield quick solutions, missing their deeper purpose. Molitor’s (2009) scepticism towards scenarios as mere “parlour games” echoes this concern, yet he acknowledges their value in drawing out “useful intellectual conclusions” when thoughtfully framed (p. 139). Scenarios provoke discussion, fostering collaborative learning and pushing participants to explore possibilities beyond the obvious. Their goal is not to deliver solutions but to spark fresh ideas, including ridiculous futures (Dator’s Second Law), challenging assumptions and broadening perspectives.

Pierre Wack’s (1984) notion of scenarios as “the gentle art of re-perceiving” encourages university leaders to move beyond conventional thinking, fostering new insights and innovative approaches. Barber (2009) adds that scenarios can help leaders “discover doubt” in their assumptions, prompting a critical re-evaluation of beliefs and a richer understanding of future possibilities (p. 140). This shift from forecasting to deeper insights is crucial for university administrators. Inayatullah and Curry highlight that scenarios enable leaders to embrace uncertainty, envision alternative futures, and uncover transformational opportunities for change. Wilkinson (2009) adds that this adaptive approach supports strategies responsive to changing educational environments, ensuring that institutional plans remain resilient and open to transformative possibilities (p. 108).

While data-driven methods like Molitor’s offer strategic clarity, they often overlook the imaginative element that scenario planning brings: an openness to ambiguity that shifts leaders away from deterministic thinking. Effective scenario planning combines empirical rigour with creative exploration, crafting strategies that remain adaptable and aligned with institutional goals. Rooted in participatory dialogue and collaboration, it transforms scenarios from abstract exercises into tools for shared learning and strategic thinking. Judge (2009) argues that such methods “engender appropriate action” by fostering “coherent responses” to complex challenges, which require a comprehensive view of diverse perspectives (p. 130). Without this inclusive approach, scenarios risk becoming, in Molitor’s words, mere “paper bluster.”

Scenario planning resembles a murmuration of starlings—fluid, unpredictable, and coordinated. Just as starlings adjust to shifting conditions, participants in scenario planning must operate within an evolving ecosystem of ideas and uncertainties. There is no fixed path; instead, individuals and teams shift course as they navigate the present and imagined futures. Like starlings mid-flight, scenario participants remain agile, attuned to emerging insights, while keeping long-term goals in sight.

Facilitated dialogues serve as gathering points where participants exchange perspectives and build shared understanding, sparking ideas that may develop into strategies. This process requires flexibility, ensuring that all voices contribute to the collective momentum. As scenario planning environments evolve, participants must re-evaluate assumptions and adapt. Instead of providing a rigid map, scenario planning offers a well-tuned compass, guiding leaders through uncertainty and enabling meaningful responses to emerging challenges, fostering resilience and adaptability for sustainable change.

By engaging in participatory scenario planning, leaders create a strategic culture that actively leverages diverse perspectives. Barber (2009) highlights how well-crafted scenarios uncover hidden assumptions, challenging the “intelligence trap” that often restricts institutional vision (p. 140). This inclusive dialogue encourages administrators to approach decision-making with curiosity and caution, recognising the value of different viewpoints in addressing complex, “wicked problems” that resist simple solutions, as Wilkinson (2009) notes (p. 108).

Scenario practices can help leaders overcome what Wilkinson (2009) calls the “paralysis” of overly rigid frameworks, instead fostering a culture of “ongoing tracking and early warning” that supports adaptive strategic thinking (p. 110). This equips administrators to anticipate shifts in higher education, aligning short-term actions with long-term goals. The adaptability cultivated through scenario planning empowers university decision-makers to proactively confront complex challenges, maintaining resilience as they guide their institutions through uncertain futures.

The findings of the Higher Education Taiwan 2050 project will be published with the aim of equipping Tamkang University leaders to practice Wack’s “gentle art of re-perceiving” (1984). By applying the principles of the “macroscope,” identifying predetermined elements, and encouraging a shift in mindset, this project seeks to foster a broader, more adaptive understanding of the educational environment, empowering leaders to transcend outdated assumptions and embrace strategic, long-term change as the university nears its centennial milestone.

Notes

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References

- Argyris, C. (1977). Double-loop learning in organizations. *Harvard Business Review*, 55(5), 115–125.
- Argyris, C. (1991). Teaching smart people how to learn. *Harvard Business Review*, 69(3), 99–109.
- Baraniuk, C. (2024). Electricity grids creak as AI demands soar. *BBC Technology*.
<https://www.bbc.com/news/articles/cj51l89dy2mo>
- Barber, M. (2009). Questioning scenarios. *Journal of Futures Studies*, 13(3), 139–146.
- Burke, R. (2009). From strategic foresight to conversations about alternative and desired futures: Using scenarios to transform the present. *Journal of Futures Studies*, 13(3): 99–104.
- Chermack, T. J. (2007). Assessing the quality of scenarios in scenario planning. *Futures Research Quarterly*, Winter, 2007.
- Cilliers, P. (2005). Complexity, deconstruction and relativism. *Theory, Culture & Society*, 22(5), 255–267.
- Dator, J. (2006). Till the ductile anchor hold: Towards space settlements in the 21st century. *Next Generation Exploration Conference*, 2006. <https://core.ac.uk/download/pdf/42754846.pdf>
- Dhami, M. K., Wicke, L., & Onkal, D. (2022). Scenario generation and scenario quality using the cone of plausibility. *Futures*, 142. <https://doi.org/10.1016/j.futures.2022.102995>
- Galtung, J. (1998). *Essays in peace research* (Vols. 1–6). Christian Ejlertsen.

- Goldman Sachs. (2024). AI is poised to drive a 160% increase in data center power demand. <https://www.goldmansachs.com/insights/articles/AI-poised-to-drive-160-increase-in-power-demand>
- Google. (2024). *Environmental Sustainability Report*. <https://sustainability.google/reports/google-2024-environmental-report/>
- Heikkila, M. (2023). Making an image with generative AI uses as much energy as charging your phone. *MIT Technology Review*. <https://www.technologyreview.com/2023/12/01/1084189/making-an-image-with-generative-ai-uses-as-much-energy-as-charging-your-phone/>
- Hodgson, C. (2024). Microsoft's emissions jump almost 30% as it races to meet AI demand. *Financial Times*. <https://www.ft.com/content/61bd45d9-2c0f-479a-8b24-605d5e72f1ab>
- IEA. (2021). *Net Zero by 2050*. <https://www.iea.org/reports/net-zero-by-2050>
- Inayatullah, S. (1998). Causal layered analysis: Poststructuralism as method. *Futures*, 30(8), 815–829. [https://doi.org/10.1016/S0016-3287\(98\)00086-X](https://doi.org/10.1016/S0016-3287(98)00086-X)
- Inayatullah, S. (2008). Six pillars: Futures thinking for transforming. *Foresight*, 10(1), 4–21. <https://doi.org/10.1108/14636680810855991>
- Inayatullah, S. (2009). Questioning scenarios. *Journal of Futures Studies*, 13(3), 75–80.
- Inayatullah, S. (2013). Futures studies: Theories and methods. In *There's a Future: Visions for a Better World*. BBVA.
- Inayatullah, S. (2020). Co-creating educational futures: Contradictions between the emerging future and the walled past. *Education Research and Foresight Working Paper 27*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000373581>
- Inayatullah, S. (2024). What can we learn from the future? - The role of futurists in achieving sustainable development with Sohail Inayatullah of UNESCO. *UNSDG: Learn*. <https://www.unsdglearn.org/podcast/what-can-we-learn-from-the-future-the-role-of-futurists-in-achieving-sustainable-development/>
- Inayatullah, S., & Sweeney, J. (2020). From strategic to transformative foresight: Using space to transform time. *World Futures Review*, 13(1). <https://doi.org/10.1177/1946756720971743>
- Judge, A. (2009). Stepping into, or through, the mirror: Embodying alternative scenario patterns. *Journal of Futures Studies*, 13(3), 129–138.
- Le Marois, J., Pales, A., & Bennett, S. (2023). Reaching net-zero emissions demands faster innovation, but we've already come a long way. *IEA Commentary*. <https://www.iea.org/commentaries/reaching-net-zero-emissions-demands-faster-innovation-but-weve-already-come-a-long-way>
- Microsoft. (2024). *2024 Environmental Sustainability Report*. <https://www.microsoft.com/en-us/corporate-responsibility/sustainability/report>
- Milojević, I., & Inayatullah, S. (2015). Narrative foresight. *Futures*, 73, 151–162. <https://doi.org/10.1016/j.futures.2015.08.007>
- Molitor, G. T. T. (2003). Molitor forecasting model. *Journal of Futures Studies*, 8(1), 61–72.
- Molitor, G. T. T. (2009). Scenarios: Worth the effort? *Journal of Futures Studies*, 13(3), 81–92.
- Molitor, G. T. T. (2009). If it works, use it: Symposium response. *Journal of Futures Studies*, 13(3), 155–156.
- News from Secretariat. (2015). Students of Tamkang University share their vision of creativity on 2030 campus. *Tamkang University*. <http://www.ac.tku.edu.tw/app/news.php?Sn=928>
- Rozite, V., Miller, J., & Oh, S. (2023). Why AI and energy are the new power couple. *IEA*. <https://www.iea.org/commentaries/why-ai-and-energy-are-the-new-power-couple>
- Sardar, Z. (2010). The namesake: Futures; futures studies; futurology; futuristic; foresight - What's in a name? *Futures*, 42(3), 177–184. <https://doi.org/10.1016/j.futures.2009.11.001>
- Slaughter, R. (2006). Beyond the mundane: Towards post-conventional futures practice. *Journal of Futures Studies*, 10(4), 15–24.
- Tangermann, V. (2023). You'll be astonished how much power it takes to generate a single AI image. *The Futurism*. <https://futurism.com/the-byte/power-generate-single-ai-image>

- Tickell, P. (2023). Camden imagines. *Moral Imaginations*. <https://www.moralimagnations.com/camden-imagines>
- Wack, P. (1984). *Scenarios: The gentle art of re-perceiving: One thing or two learned while developing planning scenarios for Royal Dutch/Shell* (Working Paper No. 9). Harvard University, Graduate School of Business Administration, Division of Research.
- Wilkinson, A. (2009). Scenarios practices: In search of theory. *Journal of Futures Studies*, 13(3), 107–114.