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# Learning to use the future: developing foresight capabilities through scenario processes



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## ABSTRACT

Organizational learning is one type of value created by scenarios and strategic foresight within companies. However, relatively little attention has been devoted to what and how individuals – such as managers and strategists – learn from participation within strategic scenario processes. The paper focuses on the learning effects of scenario processes on participants, using the Futures Literacy Hybrid Strategic Scenario (FL HSS) method. It presents an evaluative framework for capturing the learning and cognitive effects of using the imaginary future, and the learning benefits derived by participants in intensive scenario processes. The paper outlines how scenario activities change the capabilities of the individuals and organizational systems to understand the nature and role of the future for what they perceive and what they do. Cognition is the domain of the individual rather than the organization and, as a result, the micro processes through which individuals learn and challenge mental models appear to be antecedent resources to collective mental model changes within organizations. This suggests that companies should invest in pedagogically rich scenario processes that develop the capability of managers to sense changes. The learning generated by scenario processes can strengthen the ‘sensing’ dynamic capabilities of firms.

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## 1. Introduction

This paper addresses two important issues for strategic foresight practice and theory. The first is the value of strategic foresight – particularly scenario work. Here we focus on the learning effects of scenario processes on participants. The second is the difficulty posed when engaged in scenario work by the lack of robust theory, as already noted by recent academic literature (Chermack, 2005; MacKay and Tambeau, 2013).

Strategic foresight activities are used by companies to support a range of functions and objectives, including strategic decision-making, business development and innovation (Bradfield et al., 2005; Coates et al., 2010; Costanzo, 2004a;

Daheim, 2008; Day and Schoemaker, 2004a; O'Brien and Meadows, 2013; Sarpong and Maclean, 2011). Concerns regarding uncertainty are also important triggers for companies to engage in strategic foresight work (Tapinos, 2012; Vecchiato and Roveda, 2010). Given the resources devoted to strategic foresight efforts by companies, a *prima facie* case can be made for its value and impact. Although there is little robust evidence of the effect of scenario planning on firm performance (Amorim Varum and Melo, 2010), there are many documented cases in which strategic foresight activities have guided firms along paths that have resulted in concrete successes for the company, i.e. improved corporate outcomes (surviving and thriving) (Coates et al., 2010; Costanzo, 2004a; Heger and Rohrbeck, 2012).

Recent work has sought to unpack the value-creating benefits of strategic foresight activities for companies. The predominant hypothesis or model used to describe and explain

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such impact rests on the proposition that strategic foresight improves decision-making (Vecchiato, 2012), organizational ambidexterity (Bodwell and Chermack, 2010), organizational learning (Bootz, 2010), strategic agility (Doz and Kosonen, 2008a, 2008b), and the dynamic capabilities of firms to survive and grow in the face of competitive and uncertain environments (Ramírez et al., 2013; Rohrbeck, 2012). Explicit anticipatory activities influence the cognitive capabilities of the organization to sense and make-sense of changes, risks, opportunities and the need for strategic shifts. Foresight activities, when deployed on an on-going basis and as a capability diffused throughout the organization's culture and structure, can continuously provide new or refocused lenses for identifying weak signals that cannot be detected using the dominant search logic of the businesses (Day and Schoemaker, 2004b; e Cunha and Chia, 2007; Winter, 2004).

Taking advantage of the value offered by the effective integration of strategic foresight activities into everyday operations and management within the corporate setting requires building up individual capabilities and establishing good systems for organizational learning (Sarpong and Maclean, 2011). There are many options and resources available to organizations and corporate leaders with an interest in advancing strategic foresight capabilities and systems – developing organizational capability, and operating at different levels and within different functions in the company. For example, approaches such as backcasting and visioning often require an alignment and repurposing of the whole organization. Whilst elaborate processes and methods might be employed in some strategic foresight activities that involve teams from multiple business units, others focus on individual processes of learning and cognition. One main approach is addressed by the primary research question guiding this paper: How does the deployment of strategic foresight activities change the capabilities of the individuals and organizational systems to understand the nature and role of the future for what they perceive and what they do? This paper addresses how strategic foresight processes influence the domain of learning, cognition and enhancing capabilities. We develop and apply a framework for evaluating the learning of participants in scenario workshops using the Futures Literacy Hybrid Strategic Scenario (FL HSS) method (Miller, 2007). Using the results of a FL HSS process run with participants from multiple companies (and other organizations) in Brazil, the paper presents the results of a reflective survey conducted by participants in which they self-evaluate how their understanding of the future has been affected through their full immersion in the scenario process. It assesses the learning and knowledge generated by the method – and sets this in the context of individuals' previous knowledge of strategic foresight and the way in which they frame the future.

The paper makes two principal contributions. First, it presents an evaluative framework for capturing the learning and cognitive effects of using the imaginary future. Second, on the basis of this evaluative framework there is an assessment of the learning benefits generated by using a specific methodology for working with the imaginary future.

## 2. Literature review

There is a wide range of existing knowledge and literature on the role, methods and value of strategic foresight within

organizations. Strategic foresight activities vary in terms of purpose, structuring and approaches (Coates et al., 2010; O'Brien and Meadows, 2013; Rohrbeck, 2012; Rohrbeck and Gemünden, 2011; Wright et al., 2013a, 2013b). Here we review the literature that is relevant to the main scope and interest of our paper: the value of strategic foresight – specifically scenario processes – with a particular emphasis on individual learning and cognition.

### 2.1. Main uses and objectives of foresight and scenarios

Several authors have sought to synthesise contemporary understanding of the objectives and deployment of scenarios and other strategic foresight methods within the corporate setting. In a review of scenario planning literature, the main categories of applications of firm-based strategic foresight activities were identified as follows: strategic decision-making, change management, finance, product or service development, supply-chain management and logistics, economies, government and policies, and environment; the category with the highest number of appearances was strategic decision-making (Amorim Varum and Melo, 2010). Rohrbeck (2012) identifies new potential value creation contributions of corporate Foresight under three general categories: to trigger responses, start and facilitate strategic discussions to enable strategic change, and identify and support acquisition of needed strategic resources. Other research using cross-case analysis has suggested that corporate Foresight has three distinct roles in innovation: outside the innovation process/funnel as a strategist role, at the start of the innovation funnel (initiator role), and as an opponent role along the innovation funnel (Rohrbeck and Gemünden, 2011). Durand and Godet (Coates et al., 2010) make a distinction between confidential scenario processes used by an executive team to develop enterprise strategy and scenarios for mobilising staff resources and consciousness in the face of significant external change – where the communication of strategy across the company is a central goal. For many firms strategic foresight activities are an important part of innovation processes – in product development and visioning (Andriopoulos and Gotsi, 2006; Sarpong and Maclean, 2012) and in guiding strategic innovation (Rohrbeck and Gemünden, 2011; van der Duin and Hartigh, 2009; von der Gracht et al., 2010).

### 2.2. Cognition, learning, weak signals and mental models

One of the main, generic motivations for conducting strategic foresight work has been the perception of environmental uncertainty. Because of the way in which the future is understood by most people and leaders in particular, discontinuities and unpredictable external contexts are seen as a rationale for deploying the analytical, cognitive and learning frameworks that can help companies navigate through the 'fog' of uncertainty (Day and Schoemaker, 2004a; van Notten et al., 2005). Investments in environmental scanning are one response for dealing with this way of understanding the future and uncertainty (Daheim, 2008). Organizations use foresight for 'improving perception of opportunities and options' (Bezold, 2010, p.1514). Foresight activities provide important lenses for sensing and identification of weak signals that may be undetected through the dominant search logic of the

business (Day and Schoemaker, 2004b; e Cunha and Chia, 2007; Winter, 2004).

One of the roles of strategic foresight and scenarios has been to challenge mental models and prevailing assumptions (Rohrbeck, 2012; Schwartz, 1995; Van der Heijden, 1996; Vecchiato and Roveda, 2010; Wack, 1985). Mental models provide individuals and organisations with a way of managing and understanding complex phenomena. However, mental models need to be challenged and renewed in light of dynamic environmental conditions. Important signals can be undetected by the main sensing activities of the company (Day and Schoemaker, 2004a; e Cunha and Chia, 2007; Winter, 2004) and organizations have a tendency to interpret the world according to their own 'cognitive categories' (Tsoukas and Shepherd, 2004). There has been a long standing interest in the way organizations consciously or unconsciously filter information, and how mental models respond to weak signals of change (Ansoff, 1979). This can influence the search direction and methods of the organization (what to look for, and where), and the managerial resistance to dissonant information that does not sit comfortably with the prevailing mental model (Ansoff, 1984; Ilmola and Kuusi, 2006). The way in which organizations capture and use signals – within a 'sensemaking' process (Weick, 1995) is important from the perspectives of cognition and learning. Counterfactual reasoning is considered to be important in overcoming cognitive biases in strategic decision making, and in developing improved, 'foresightful' thinking (Mackay and McKiernan, 2004a, 2004b).

An important distinction has been made between individual and collective learning in foresight processes. Bootz distinguishes between 'foresight attitude', which 'refers to the cognitive dimensions of anticipation and to individual learning' (Bootz, 2010, p. 1588), and 'foresight activity' where groups of individuals participate in more interactive learning within organizations. Several authors refer to foresight as a learning process (Antonacopoulou, 2010; Costanzo, 2004b; Rohrbeck and Schwarz, 2013). However, relatively little attention has been focused on what individuals learn within foresight processes. Returning to the concept of 'foresight attitude', it has been suggested that 'the cognitive virtues of anticipation (paradigmatic mobility, questioning and enrichment of representations)' are 'focused on the individual (futurist, manager, and strategist)' (Bootz, 2010, p.1589). Within the organizational context, foresight has been conceptualized as 'planned learning' (Vecchiato, 2012) combining elements of the planning and learning strategy schools.

The primary focus of this paper is individual learning and value from foresight.

### 2.3. *Foresight, scenarios and dynamic capabilities*

The resource-based view (RBV) (Barney, 1991; Prahalad and Hamel, 1990; Wernerfelt, 1984) is one of the principal strategic management frameworks for understanding how companies build and maintain competitive advantage. According to RBV, firms' success is founded upon valuable, rare, inimitable and non-substitutable resources – and how these are bundled or packaged together effectively within the company. For strategic foresight and strategic management, the concept of 'dynamic capabilities' has been an influential and rich area for research, which builds on RBV principles. Dynamic

capabilities have been defined as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997).

It is argued by Eisenhardt and Martin that dynamic capabilities differ from, but augment, the RBV in that that can be thought of as the "... antecedent organizational and strategic routines by which managers alter their resource base" (Eisenhardt and Martin, 2000, p.1107). They also propose that in dynamic, fast-moving contexts, these routines and processes become simpler, more experiential and shorter term. Three dynamic capabilities have been proposed: sensing the environment, seizing opportunities and reconfiguring resources (Teece, 2007). The role of foresight in enhancing dynamic capabilities has been explored for innovation in firms (Rohrbeck and Gemünden, 2011). Other authors have conceived of scenarios as dynamic capabilities and have put forward six cognitive aspects, including 'Framing' and 'Reframing' (Ramírez et al., 2013). Doz and Kosonen (2008a, 2008b) also highlight the importance of Foresight in the meta-capabilities that are needed for strategic agility.

### 2.4. *Scenarios: the role of theory*

Strategic foresight is situated in the rich discourses of social theory, strategy, organizational theory, learning and understanding of knowledge – to name but a significant few. Within more ambiguous conditions of significant change, firms can often be at the 'edge of chaos' (Kauffman, 1995). These situations can crop up both within and outside the structural and conceptual boundaries of what is known and challenge the continuity of ways of seeing and doing. Strategic management has recognised the challenges of adjusting frameworks to address systems functioning in complex emergent reality (Beinhocker, 1997). In novelty rich environments strategic improvisation is the only way to actually engage the capacities of the organization with the potential of the emergent present. The dynamic capabilities of the firm are experiential and iterative processes – relying on improvisation as 'real time foresight' (e Cunha et al., 2012).

Several decades' worth of development and application of the scenario method have provided a stock of knowledge for analysis and reflection. Among the many useful analyses completed over recent years are those on typologies of the scenario methods used (Bishop et al., 2007; Börjeson et al., 2006; van Notten et al., 2003). Whereas knowledge has been accumulated on the scenario method and its application, there is a view that there has been a lack of theorising around scenarios (Chermack, 2005; MacKay and Tambeau, 2013). Chermack (2005) sets out a framework or process for developing theory in scenarios, based on (neo-) positivist principles. Voros (2008) uses an established typology of research paradigms (positivism, post-positivism, critical theory, constructivism and participatory) and traces a general shift within futures from the objectivist to the subjectivist. This mirrors the overall movement in socio-economic disciplines. There have been notable contributions to theorising foresight and scenarios work, including the Post-Structuralist Causal Layered Analysis (Inayatullah, 1998), multi-ontology frameworks (Aaltonen, 2007; Aaltonen and Holmström, 2010), structuration (MacKay and Tambeau, 2013), disruption theory (Burt, 2007), and social practices (Sarpong, 2011). One

**Table 1**  
Levels of futures literacy – tasks and techniques.

Futures literacy	Task	Technique
Level 1 awareness	Temporal awareness, shifting both values and expectations from tacit to explicit – all of which build the capacity of people, teams and leaders to respond and innovate	A wide range of catalysts and processes generate the discussions and sharing of stories that elicit people's views on what they want and expect in the future
Level 2 discovery	Rigorous Imagining (RI) involves two distinct challenges – imagination and rigour, the former in order to push the boundaries and the latter so that what is imagined is “scientific” and intelligible	Escaping from the probable and preferable to imagine the possible demands systematic creativity and creating systematically; non discursive reflection and social science are essential ingredients
Level 3 choice	Strategic scenarios are aimed questioning the assumptions used to make decisions in the present, not as targets to plan-by but to provide new insights into the potential of the current world as a way to embrace complexity, heterogeneity and the pertinence of spontaneous actions that put values into practice	Strategic scenarios are constructing using the capacities and stories acquired in developing Levels 1 and 2 FL, by combining values, expectations and possibilities into scenarios that follow the narrative rules and the methods of “history of the future”

relatively recent contribution to the development of new, theory-informed scenario creation methods has been Miller's FL HSS Method (Miller, 2007). It draws on a number of theories and contributions in the fields in complexity and anticipatory systems.

Strategic foresight activities are influenced by organisational culture and processes, and may dovetail with other rational analytical techniques in supporting decision-making. Experimentation and creativity are important for strategic foresight activities – as they are for the firm as a whole. Improvement of ‘mainstream’ scenario methods may pay dividends (Postma and Liebl, 2005) but the greatest potential for innovation, progress and insight in strategic foresight may be found in the richness of contemporary debates on the organisations, strategy and social theory – and their epistemological and ontological foundations.

### 3. Futures literacy: hybrid strategic scenario method

Scenarios have been widely used for strategic purposes by companies and other organisations, particularly to explore uncertainties and to consider how current trends and drivers might shape the future. There has been a weighty critique of some scenario methods for their predictive assumptions, models of change and the value that they can offer. These critical discussions have been played out within the fields of strategic management and strategic foresight. One of the fundamental disciplinary challenges is ‘how to deal with the unknowable and novelty rich future. For a long time now futurists have accepted that prediction and probability are limited ways of thinking about the future. But knowing what does not work is not the same as knowing what does’ (Miller, 2011).

This section discusses an approach, the Futures Literacy - Hybrid Strategic Scenario Method (FL-HSS), which has been designed to enhance strategic management and decision-making, based on the principles of rigorous imagining and reframing – to understand the potential of the present. The FL-HSS approach is grounded in the theoretical perspectives of emergence, complexity and anticipatory systems. A full account of the method has been published elsewhere (Miller, 2007) but here we summarise the principal elements of its implementation.

The FL-HSS process builds capacity and produces knowledge at the same time. It is a learning-by-doing exercise that enables participants to become more sophisticated in how they

use the future while at the same time generating new knowledge about the present by using the future. Table 1 summarises the levels, tasks and techniques used within the framework. At each step in the process collective intelligence knowledge creation occurs because a group of people are engaged in shared sense-making. Of the knowledge generated, a considerable proportion is of necessity related to the anticipatory assumptions that people are obliged to use in order to describe the imaginary future. From an anticipatory systems and processes perspective the primary source of information or data consists of anticipatory assumptions. The phases of the FL HSS process make anticipatory assumptions evident to both participants and observers. Drawing attention to this data, produced by the participants themselves, is one of the main starting points for developing an awareness of anticipatory systems and processes, the first step towards greater FL.

Over recent years, the Futures Literacy Hybrid Strategic Scenario (FL HSS) Method– has been developed and used in a range of organisations to re-conceive the potential of the present as a way to improve strategic decision-making (Miller, 2007). FL HSS is a three-phase process in which organisations build strategic scenarios of a possibility space (through rigorously imagined changes in systemic conditions) that lead to different strategic options for decision-making in the present. These are contrasted with the more probabilistic thinking practices that tend to guide strategic management. FL HSS provides a Foresight framework for addressing re-framing conditions and strategic choices for firms.

## 4. Methodology

### 4.1. Development of survey evaluation tool

Following multiple applications of the FL HSS method in a range of contexts internationally, a survey tool was developed to evaluate participants' views and to capture the learning from the scenario process<sup>1</sup>. The survey evaluation tool was designed to be used during FL HSS processes – typically in intensive 2-

<sup>1</sup> Contributions to the development of this tool were made by a number of participants in UNESCO foresight project, Scoping Global/Local Anticipatory Capacities, that was supported by The Rockefeller Foundation in 2013-2014. Members of this project who contributed to developing the survey include: Cristiano Cagnin, Keri Facer, Roberto Poli, Pierre Rossel, Ilkka Tuomi.

**Table 2**  
Learning gained by scenario participants.

Rank	1	2	3	4	5
<b>We understand the future better</b>	8	1	4	3	2
<b>We understand our alternatives better</b>	9	5	2	1	1
<b>We understand our problems better</b>	3	8	6		1
<b>We understand how the workshop participants think about the future</b>	4	3	4	4	3
<b>We know the best way to act</b>	3	3	6	2	4

day scenarios workshops. The survey evaluation tool also assesses the context and ‘starting point’ of the individual: previous experience of futures and foresight projects; and foresight methods used.

Much of the survey evaluation tool focuses on participants’ conceptualization and cognitive categories of the future – which inform any strategic foresight practice. These questions focused on the concept of the future; reason to think about the future; the nature of surprises; metaphors; views on the success of the workshop and what participants had gained.

#### 4.2. Data collection and evaluation

Data was collected during a 2-day Futures Literacy UNESCO Knowledge Lab (FL Knowlab) held in Brazil in July 2013 – Exploring the Future of Science in Brazilian Society: Imagining 2040. The aim of the workshop was ‘to give participants an opportunity to learn about anticipatory systems, how we use the future’ by considering the topic of the future of science in Brazilian society. The workshop was designed to facilitate collective intelligence processes that surface knowledge and assumptions in an explicit way by generating shared meaning and sense-making about the future. A key design principle underpinning the choice of methods used to conduct the workshop is that creation of knowledge through collective intelligence processes exposes the anticipatory assumptions that we use to imagine the future. As such, it constitutes one of the main ways to conduct research into individual and collective anticipatory systems and processes. There were 24 participants in the workshop: the largest representation came from companies and NGOs (both with 6 representatives). Participants were given time at the end of the workshop programme to complete the (self-) evaluation survey. For ease of use and to encourage response, most of the questions consisted of options to be selected.

#### 4.3. Proposition

The main proposition is that the Future Literacy scenario method provides dual value to individuals: helping them both to create new strategic choices in their field of work and (in so doing) to learn how to use the future in a new disciplinary way.

## 5. Results

### 5.1. Prior knowledge of foresight

To ascertain the point of departure for participants within the FL Knowlab, they were asked about their existing expertise and knowledge in foresight. Given a range of options from ‘No

previous expertise’ to ‘expert’, the majority stated that their level of expertise was ‘beginner’ (14/24). Whilst 6 of the participants described themselves as ‘experienced’, and one as ‘expert’, only 3 out of the 24 did not have previous expertise.

Participants were asked about sources of foresight knowledge, with 6 options (Chart 1). For this question, 22 out of 24 respondents gave answers; 2 participants gave 2 answers; 3 participants gave 3 answers; and 1 participant gave 4 answers. The most common sources of knowledge were books or articles, and general presentations. A total of 7 participants reported that they had participated in foresight projects.

### 5.2. Reasons for thinking about the future

Participants were asked to identify the main reason for thinking about the future. The instruction was to select only 1 option but 2 participants selected more than one. Chart 2 presents the results from the responses of 22 of the 24 participants. The most common reason given was ‘to invent new possibilities’.

### 5.3. Conceptualizing the future

Participants were asked a series of questions to explore their conceptualization of the future, and to surface ontological and epistemological assumptions. The first question focused on the nature of surprises, participants were provided a scale from ‘strongly disagree’ to ‘strongly agree’. They were given 7 statements, as outlined in Chart 3. The strongest levels of agreement were recorded with the statements that the world is too complex, that the world is open, and that the world changes too fast.

To assess how participants conceive of time, they were presented with 5 different metaphors. The metaphors which had the highest level of agreement were ‘a spiral’ and ‘a river’ (Chart 4).<sup>2</sup>

To probe anticipatory and other factors and their link to action, participants were asked to respond to the actions of a bird sitting on a rock – both responding to what has just happened and anticipating what comes next (Chart 5).

### 5.4. Participants views on scenario workshop process

Participants were asked about the learning they had gained from the workshop. They were asked to rank from 1 to 5 with 1 being most important (Table 2). A total of 18 participants completed this part of the survey evaluation questionnaire; 2 or 3 criteria were equally ranked by 9 participants. The two key learning aspects that were ranked most highly by participants were a better understanding of their alternatives and a better understanding of their future.

However, participants were less convinced they knew the ‘best way to act’ – even if they understood the future better and understood their options better. This offers a potentially important insight into what it means to become more futures

<sup>2</sup> Given the nature of the questionnaire there was no further feedback on the metaphors, so specific interpretations are not available. What is of interest is the extent to which the flow and recursive images resonated more than constructed, repetitive or linear ones.

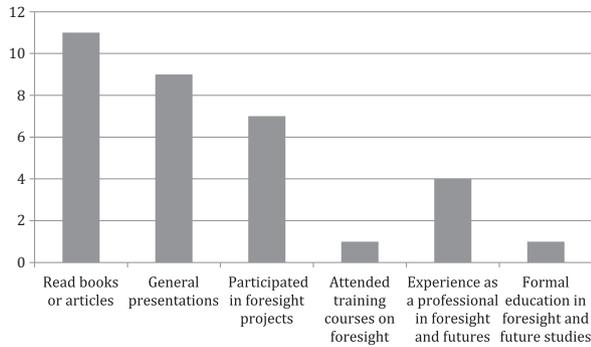


Chart 1. Sources of futures and foresight knowledge.

literate. Even as participants become more articulate regarding the assumptions that underpin their descriptions of imaginary futures they also become aware that there are different kinds of future and different ways of thinking about these different kinds of future. As participants become more futures literate they begin to distinguish closed from open futures and understand that planning to colonize tomorrow with today's idea of the future is not the same as searching for the emergent novelty that may be hidden by an excessive focus on extrapolatory futures.

6. Discussion

The aim of the paper has been to understand the value and learning that participants derive from scenario processes. The main proposition was that the Future Literacy scenario method provides dual value to individuals: helping them both to create new strategic choices in their field of work and (in so doing) to learn how to use the future in a new disciplinary way. The FL scenario method has been co-designed and implemented in over 60 specific cases, with companies and other organizations around the world. In this paper, we present the results of first use of an evaluative tool designed to capture some of the learning of individuals that have engaged in intensive 2-day scenario workshops. Given the scope of the paper and current knowledge of scenario theory and practice, here we focus on three broad themes that appear to be significant. First is the value of Futures Literacy in generating learning. Second is the

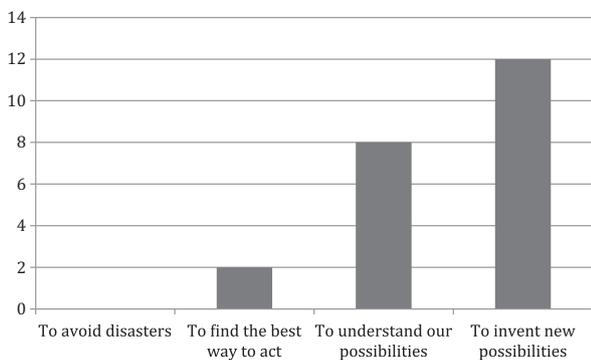


Chart 2. Main reasons for thinking about the future.

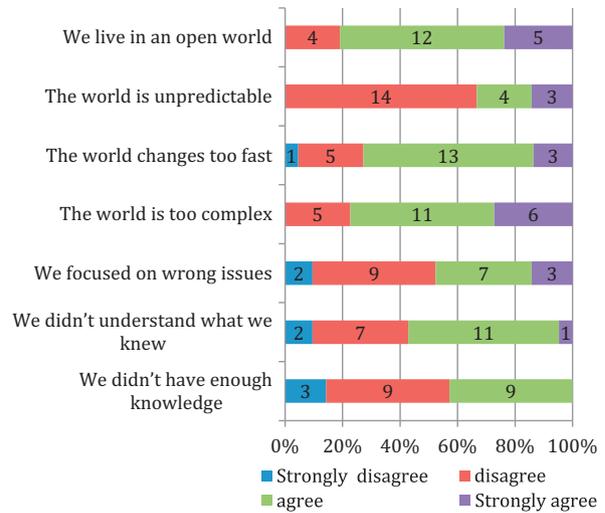


Chart 3. 'When something surprising happens, this is because':

extent to which the greater development and application of theory within scenarios can enhance learning. Third is how this approach relates to some of the academic critiques of strategic foresight practices.

Several authors have cited the importance of scenarios and strategic foresight in organizational learning (Bootz, 2010; Mackay and McKiernan, 2004a, 2004b; Rohrbeck, 2012; Schwartz, 1995; Van der Heijden, 1996; Vecchiato and Roveda, 2010; Wack, 1985) although very few pay attention to the effect of these processes on individuals' learning and cognition. Bootz (2010) distinguishes between 'foresight attitude' – the learning cultivated by individual managers – and the programmed 'foresight activity' within the organizational setting. In our study, the focus is on individuals' learning, addressing one of the gaps in foresight knowledge. Within FL in general – and manifested in the FL KnowLab process – there are, at least, two different types of learning for participants. The first is the more obvious domain-based learning as participants make explicit and negotiate shared meanings with respect to their understanding of the selected topic of the FL KnowLab (in

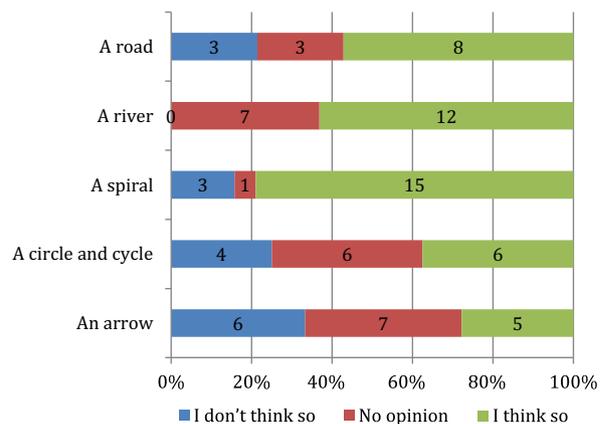


Chart 4. 'When I think and talk about the future, time is often like...':

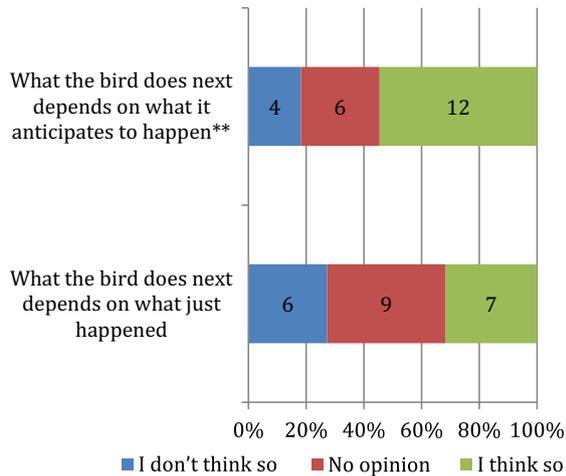


Chart 5. 'A bird sits on a rock'.

the Brazilian case the future of science in society). The second type of learning is arguably even more valuable: developing the capacity to understand the theory and practice of using the future, what might be called the discipline of anticipation. Both kinds of learning are associated with one of the inherent aspects of any attempt to describe the future – such descriptions necessitate the use of a model or models that enable the construction of imaginary situations. Thus, when participants attempt to articulate their ideas regarding the not yet existent later-than-now they are obliged to deploy a set of assumptions. The FL Knowlab is designed in such a way, different in different cultures and contexts, such that the participants become aware of their anticipatory assumptions and the role that such assumptions play in their attitudes towards the future and crucially their perceptions in the present.

The rigorous imagining phase that is central to the FL KnowLab design encourages participants to create and play with completely different frames and framing conditions – an alternative set of anticipatory assumptions and hence very different futures. As a result participants in the FL KnowLab report that they gain a better understanding of why they perceive the present as they do and that there may be a wider range of options, not only for imagining the future, but also understanding the utility of thinking about the future. This is line with some of the benefits and learning reported of scenario processes (Schwartz, 1995; Van der Heijden, 1996) and in using counterfactual reasoning (Mackay and McKiernan, 2004a, 2004b).

Several participants noted that they understood the future better through the workshop. The pedagogical value of a FL experiential learning process is a valuable learning outcome – one that adds to what is learned about the particular theme in question. Developing Futures Literacy provides a more advanced grasp of the epistemology and ontology of the future, as manifested in participants' responses to the 'bird on a rock' questions.

Recent research has represented foresight as a dynamic capability (Ramírez et al., 2013; Rohrbeck and Gemünden, 2011) and an important part of the meta-capabilities that

enable strategic agility within companies; (Doz and Kosonen, 2008a, 2008b). There is something of a paradox in the sensing aspect of dynamic capabilities in organizations. Even though dynamic capabilities form part of firms' strategic routines, cognition is the domain of the individual rather than the organization (Eden and Ackermann, 1998; Grinyer, 2000). As a result, the micro processes through which individuals learn and challenge mental models appear to be antecedent resources to collective mental model changes within organizations. FL facilitates individual learning through group participatory processes. In this sense, it offers a framework that externalizes shared learning amongst a group of individuals within organizations. This suggests that companies should invest in pedagogically rich scenario processes that develop the capability of everyone in the organization to sense and articulate the difference and repetition that characterizes complex emergent reality. Teece (2012, p.1398) highlights an important managerial function, "to achieve semi-continuous asset orchestration and renewal, including the redesign of routines". We suggest that the learning derived from strategic foresight (FL) can act as an antecedent resource within managerial capacity to re-frame search processes and to design new routines. Whilst we agree that 'top management's entrepreneurial and leadership skills around sensing, seizing, and transforming' (Teece, 2012, p.1398) are critical, FL can also support the sensing dynamic capability on a wider, participatory basis through the organization. In terms of progress and maturity, it could be argued that the dynamic capabilities theory is at an important juncture. Peteraf et al. argue for greater clarity in relation to core issues to progress dynamic capabilities from a 'promising construct into a fully developed theoretical model' (Peteraf et al., 2013, p.1396). Strategic foresight has an important role in this process.

Acknowledging the importance of the individual level (in learning) brings into play additional theoretical frames from the behavioural school (Cyert and March, 1963; Simon, 1947). Most organizational study owes at least a partial debt to behavioural theory; strategy arguably more than most (Gavetti and Levinthal, 2004; Gavetti et al., 2012). Strategy scholars interested in organizational capabilities (Teece et al., 1997) have been influenced by behavioural theory via the contributions of evolutionary economics on routines and search processes (Nelson and Winter, 1982). We propose that the macro-level strategic routines represented by dynamic capabilities need to be examined alongside, and in relation to, the behavioural level. This is particularly apposite in the context of learning (Gavetti et al., 2012), as addressed here. In 1963 Cyert and March highlighted how the role of 'search' is integrated with notions of choice but that searching becomes foreclosed. The techniques we have explored in this paper have been shown to be effective in extending and deepening this 'search' capacity at an individual level. The challenge is to ensure the individual cognitive development is coupled appropriately to the organizational routines and search processes. Some work has already been carried out by, for example Marengo et al. (2000) and Ethiraj and Levinthal (2004) and we argue that the Futures Literacy Hybrid Strategic Scenario method opens up possibilities to extend this important thread further. We might in this way contribute to the call from Gavetti et al. (2012) for behavioural theory to "...incorporate forward-looking decision making...".

Although scenario methods have become increasingly mainstream in strategic management and decision-making, there has been a critique of a significant gap between practitioner experiences and the standards of assessment, theorizing and theory building expected by the academic community (Chermack, 2005; MacKay and Tambeau, 2013). It has been suggested that the Shell 'intuitive logics' approach of scenario building – with its variants – represents the 'mainstream' in practice (Postma and Liebl, 2005) but that this approach does not adequately address the blind spots in a way needed by managers (Liebl, 2002). Chermack (2005) develops a framework for building theory for scenario planning. This includes several hypotheses that link participation in scenario planning with learning, altered mental models and improved decision-making. Although this paper reflects a different epistemological starting point to the neo-positivist approach of Chermack, we find a positive association in our proposition that the FL scenario processes assist individuals in developing the capacity to understand and use the future more effectively.

The FL scenario method is informed by several theories, including complexity and anticipatory systems<sup>3</sup>. The Rigorous Imagining (Level 2) process within FL challenges decision-makers to conceive of discontinuities – changes in the conditions of change – rather than trying to 'limit' uncertainties through a predictive lens (which is not sufficiently distanced from how the present is perceived on the basis of futures imagined using assumptions forged in the past). The construction of rich narratives (strategic scenarios) that follow robust action research and scientific principles provides a cognitive aid to re-thinking real strategic options in the present – that are more alert to the possibility spaces created by novelty (unknown unknowns). FL as a capacity enables individuals and organizations to encompass both open and closed ways of thinking. Amongst others, the approach of Aaltonen and Holmström (2010) in developing a multi-ontology framework in three different strategic environments – linear, disruptive, visionary – indicates that new approaches that combine practical utility and solid theoretical foundations are being developed and applied.

From our work we see a number of implications and potentially interesting questions for research on strategic foresight. As noted above, relatively little attention has been paid to what individuals learn from strategic foresight (particularly scenario) processes. This seems to be a worthwhile topic for further investigation. Second, strategic foresight researchers can contribute rich perspectives to dynamic capabilities (RBV) and behavioural theories; the following are examples. How do strategic foresight processes influence organizational search processes and routines? If strategic foresight is a sensing dynamic capability, does it influence changes in/selection of routines? This seems particularly interesting where strategic foresight processes indicate the need for a business model change. How is the learning generated through strategic foresight – for individuals and small groups – transmitted and used in the organization?

<sup>3</sup> As a quick aid and reminder, Level 1 surfaces participants' current expectations and values; Level 2 takes participants through a process of rigorously imagining quite different framework or systemic conditions; Level 3 focuses participants on (new) strategic choices in the present – reflecting on the richness and novelty of the frames created in Level 2 and the values and expectations identified in Level 1.

## 7. Conclusion

Foresight and strategic foresight processes produce value for companies in a number of ways. This paper addresses one of the themes – learning – where the literature indicates that there are benefits for organizations. However, relatively little attention has been paid to the role of scenario processes for individuals' learning and cognition – what and how managers learn from participating in these activities. Here we have presented an evaluative tool that captures the learning within intensive 2-day FL HSS scenario workshops, with results from the FL Knowlab case. The experience of this case – supplemented by the knowledge accumulated from multiple applications of FL HSS – point to 'learning value' for individuals in two key respects. First is the domain-based learning where participants explore and reveal shared meanings and understanding of the given topic. Second is the capacity-building process of learning how to use the future – what can be termed the discipline of anticipation. The focus on the individual is important as other evidence suggests that cognition is the domain of the individual rather than the organization (Eden and Ackermann, 1998; Grinyer, 2000).

Individual learning is then linked to corporate value, akin to connecting individual learning and 'foresight attitude' to 'foresight activity' (Bootz, 2010). Here we draw on the strategic management literature of dynamic capabilities – particularly the sensing part of dynamic capabilities within organizations. We suggest the processes by which individuals learn are antecedent resources to collective mental model changes within organizations. The implication is that companies should benefit from investing in pedagogically rich scenario processes that enhance the sensing dynamic capabilities throughout the organization, giving managers a potentially decisive approach to sustaining competitive advantage.

FL HSS offers a practical, learning-by-doing approach to using the future for strategic management in the present. The FL HSS has been deployed over sixty times in large corporate businesses, national agencies and other organisations. One of the key challenges for many participants, unsurprisingly, is to create frames that explicitly identify changes in systemic conditions. Conceptually, FL HSS provides an action research framework that 'uses the future' by re-imagining fundamentally changed conditions contained within descriptive narratives. It then engages participants to reflect on differences between the predictive/probabilistic assumptions that are routinely held by managers and the strategic options generated by envisaging radically different outcomes. Recent academic critiques have identified the need for robust theory to inform and assess scenario practice. FL HSS and the Knowlab case<sup>4</sup> represent a scenario approach that purposefully builds on robust theory. As such, it is one approach – amongst several – that seeks to reconcile utility and application with robust theory.

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<sup>4</sup> Research efforts with other cases are ongoing, with a series of FL KnowLabs around the world.

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