

Future-Oriented Pedagogies: **Key Ideas for Developing Future-Ready Learners**

Renee TAN and Priscilla PANG



01 INTRODUCTION

The pace of change facing Singapore's workforce today – driven by technological disruption, evolving industry structures, and increasingly complex work environments – places new demands on how adult learning is designed and delivered. Training that focuses primarily on transmitting established knowledge and building specific competencies, while valuable, is no longer sufficient on its own. Learners need to develop not only content mastery but also the agility to adapt, think critically under uncertainty, and co-create solutions with others. This is the challenge that Future-Oriented Pedagogies (FOP) seeks to address.

This research note distils the key ideas underpinning FOP: what it is, the epistemological assumptions that ground it, its two core techniques, the learning theory that explains how it works, the principles that guide its design, and how assessment can be approached in a future-oriented way.

What are Future-Oriented Pedagogies?

Future-Oriented Pedagogies (FOP) are ways of teaching and learning that cultivate a future orientation in learners, i.e. the capacity to grapple with and thrive in changing circumstances. Future-oriented learners think critically, adapt their knowledge and skills flexibly in new, uncertain and dynamic contexts, and create value collaboratively with their teams.

FOP moves beyond traditional approaches grounded in knowledge transmission. It creates conditions for learning agility to be developed, enabling learners to navigate and adapt to changing environments effectively. In work-related learning, a future-oriented approach supports individuals in transitioning from knowing what to do to knowing how to adapt when conditions change, ensuring that training not only delivers content knowledge but also builds confidence and capability in real-world applications.

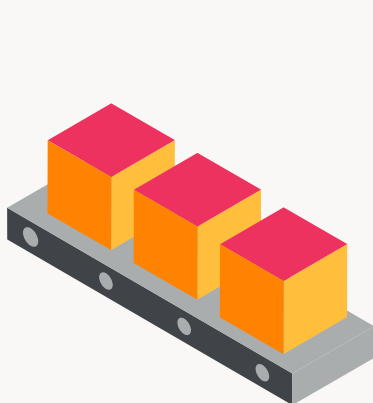


02 EPISTEMOLOGICAL GROUNDING: RK, DK AND DGK

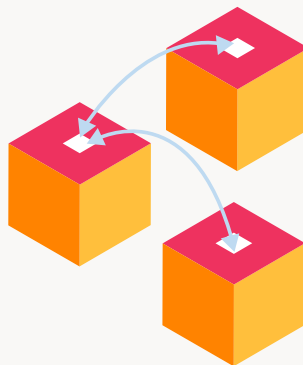
FOP is grounded in a specific epistemological position, **Dynamic Generative Knowing (DGK)**, that contrasts with two more familiar approaches to knowledge and learning.

In **Reproducing Knowledge (RK)**, knowledge is accepted as authoritative and fixed; the learner's role is to receive and reproduce content from the educator. In **Distributed Knowing (DK)**, knowledge is seen as residing in people and the environment, with learners drawing on others' experience and expertise. Both **RK** and **DK** remain relevant and appropriate in many training contexts. However, neither fully equips learners to generate new knowledge when established answers are absent and no expert is on hand to provide direction.

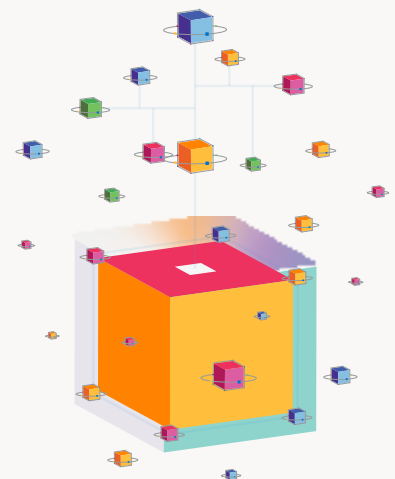
Dynamic Generative Knowing (DGK) offers a third position. In **DGK**, knowledge is collaboratively co-constructed and created among learners, peers and educators through a deliberate process designed to stimulate deep learning and critical thinking. It emphasises productive dialogue, in-the-moment sensemaking, and the transformation of thought. It is this epistemological stance that underpins FOP, enacted through two core techniques: Emergent Scenarios and Generative Dialogue.



Reproducing
Knowledge (RK)



Distributed
Knowing (DK)



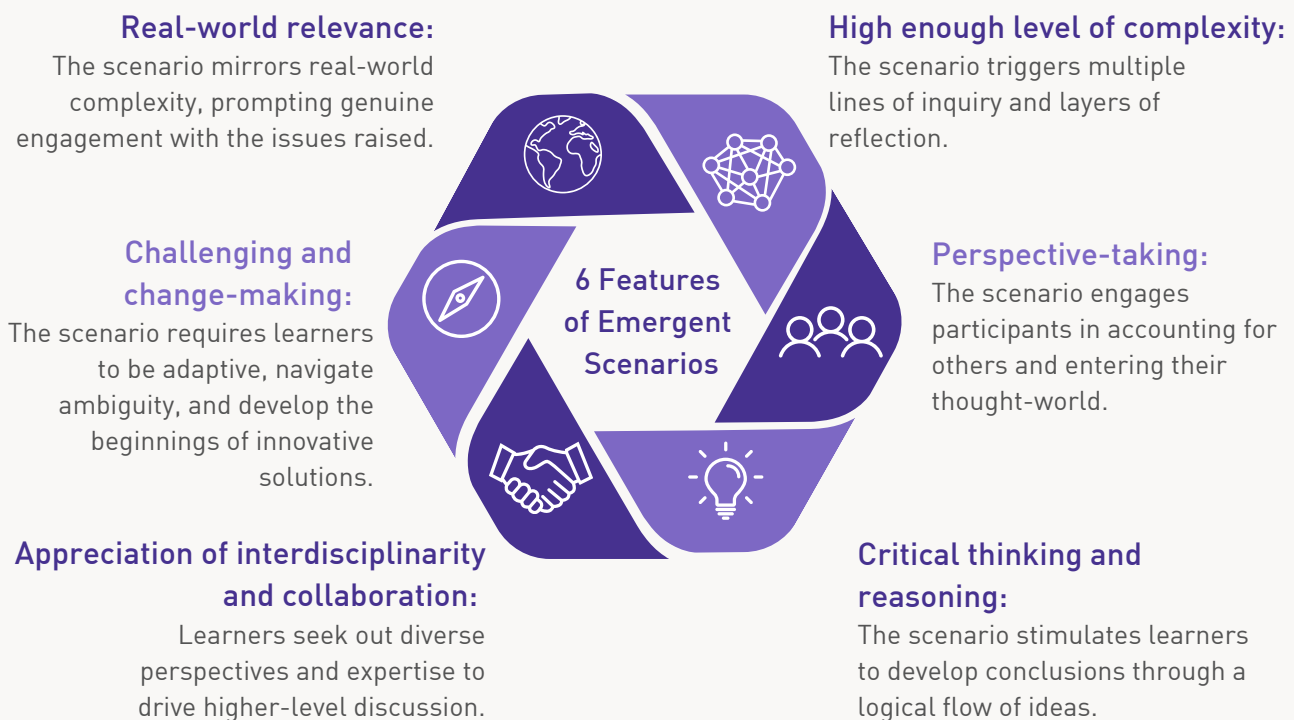
Dynamic Generative
Knowing (DGK)

03 THE TWO CORE TECHNIQUES

Emergent Scenarios

Emergent Scenarios mirror the unpredictable nature of real-world challenges. Unlike conventional scenario-based learning, which typically centres on a defined problem with predetermined solutions, **Emergent Scenarios** are deliberately designed to resist straightforward resolution. They provide learners with practice in adapting quickly to unfamiliar situations, developing the capacity to embrace uncertainty and respond effectively to evolving circumstances.

Applying this technique in practice requires educators (facilitators, trainers or curriculum designers) to design and use scenarios with the following six features:

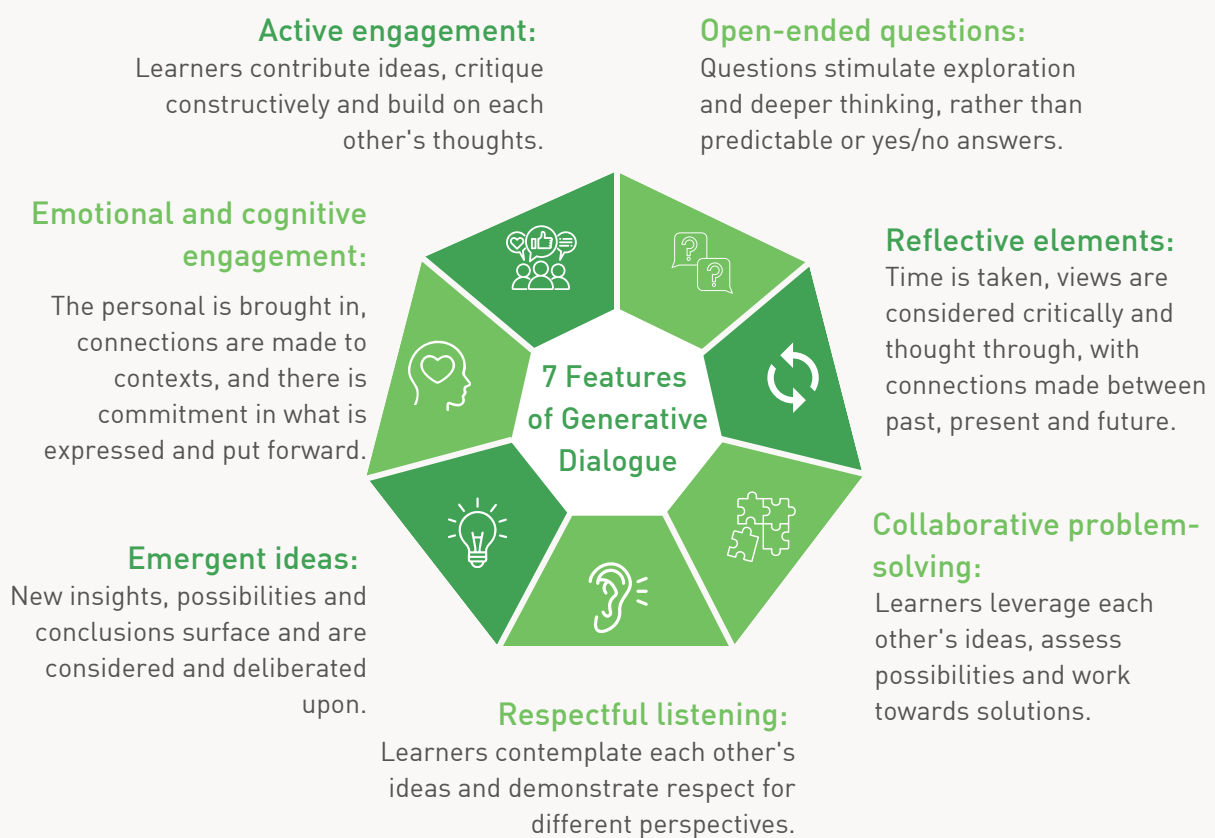


Repeated engagement with such scenarios builds learners' resilience and confidence in managing uncertainty, and develops their capacity to communicate effectively and navigate complex situations as a team.

Generative Dialogue

Generative Dialogue is the conversational process through which **DGK** is enacted. It differs from conventional dialogue not merely in degree but in kind. Rather than exchanging pre-existing ideas, generative dialogue moves beyond mere exchange towards the co-creation of novel meaning and insight, instances where existing mental models are challenged and restructured through authentic collaborative inquiry.

When engaged in generative dialogue, learners and educators participate in the following:



These elements together create conditions where existing knowledge and perspectives are refreshed or reconfigured, generating the 'light-bulb moments' where current ideas shift and new knowledge is constructed. **Generative Dialogue** fosters learning agility by challenging learners to question assumptions, surface dissonances, synthesise diverse viewpoints, test ideas and reflect on their thinking. Repeated practice builds confidence and capacity to solve problems collaboratively in complex, evolving contexts.

04 BOUNDARY CROSSING AND THE HABITUATION OF LEARNING AGILITY

The pedagogical power of both techniques lies in the process of boundary crossing they facilitate. In educational research, 'boundaries' refer to the tensions and discontinuities that arise between different sociocultural practices, values, beliefs, assumptions and perspectives. Mediating such impasses, i.e. moving into unfamiliar territory and navigating what one knows and does not know to achieve new understandings, is known as boundary crossing.

Emergent Scenarios expose learners to unfamiliar and unpredictable situations, reinforcing their capacity to adapt, experiment and respond effectively in evolving contexts. In **Generative Dialogue**, learners engage with diverse perspectives, refining their ability to synthesise knowledge, negotiate meaning and integrate new insights into practice.

Research in neuroscience and cognitive flexibility has shown that repeated exposure to varied learning experiences strengthens neural pathways, and that deliberate practice in uncertain environments leads to the development of automatic expertise. By embedding boundary-crossing experiences into repeated, structured practice, FOP cultivates learning agility as an instinctive, professional reflex.



Boundary
Crossing



Repeated Boundary-
Crossing Practice



Learning Agility
as Reflex

05 UNDERSTANDING THE LEARNING PROCESS: EXPANSIVE LEARNING

The learning process facilitated by FOP may be understood through the theory of expansive learning. Standard learning theories presuppose a known, stable and well-defined object of learning. Much of the most meaningful learning in work organisations, however, violates this presupposition: the knowledge or skill to be acquired is not stable, not defined ahead of time, and there is no competent teacher who can supply the answer.

The theory of expansive learning sets out seven strategic learning actions that individuals go through as they solve problems for which there are no known answers:



Emergent Scenarios and **Generative Dialogue** take learners through this expansive learning cycle. Working with a complex scenario, learners question its dimensions, analyse risks and assumptions, collaboratively model and test potential responses, implement new approaches, reflect on outcomes, and ultimately consolidate and generalise what they have learned into sustainable practice. With repeated practice, this process habituates learning agility in learners and performance agility in their work.

06 DESIGNING FOR FUTURE-ORIENTED LEARNING: THE SIX PRINCIPLES OF LEARNING DESIGN (6PoLD)

FOP requires that learning design move beyond preparing learners for the here-and-now and for solving predictable, standard problems. Educators must aim to develop learners' capacity to thrive in dynamically changing contexts. The Six Principles of Learning Design (6PoLD) guide educators in thinking about how to design learning that prepares future-oriented learners.

The focus is on creating dynamic learning environments built on authentic, real-world experiences; engaging learners actively in thinking, feeling and doing; and co-constructing knowledge in communities of learning.

Table 1: The Six Principles of Learning Design (6PoLD)

Principle	Description
Authenticity	Use authentic, real-world, work practices and settings to reflect the complexity of work and enable learner engagement.
Alignment	Align every aspect of learning, including objectives, outcomes, assessment, activities and learning spaces, to create a cohesive and meaningful learning process.
Holistic	Integrate multiple senses (knowing, doing, thinking and feeling), theory and practice, technical and generic skills, and abstract and concrete experiences to deepen understanding of the subject matter.
Feedback	Create opportunities for learners to give feedback and receive feedback from multiple sources (e.g. educator, peers and work supervisor), and to act on the feedback to improve their performance.
Judgement	Enable learners to make judgements about their own and others' performance to raise their understanding of what quality work is, and the performance criteria and standards expected.
Future-oriented	Develop learners' future-orientation – the ability to face future unknowns and resolve new challenges, unfamiliar scenarios or non-standard problems.

07 ASSESSMENT IN FOP: SUSTAINABLE ASSESSMENT

A key aspect of assessment in FOP is ensuring that learners develop the ability to make independent judgements about the quality of their own work and that of others. This is particularly significant when applied to novel, complex and ambiguous challenges, where there may be no readily available expert to provide definitive solutions. Learners must develop the capacity to evaluate decisions independently or in collaboration with peers, a skill that becomes crucial in navigating uncharted territory where established wisdom may be insufficient or inapplicable.

This approach is captured in the concept of 'sustainable assessment', which emphasises cultivating learners' evaluative capabilities through active engagement in assessment activities. Educators can support the development of judgement capabilities through a range of strategies: enabling learners' active and iterative engagement with quality criteria; modelling judgements on samples of work; creating space for dialogic feedback with peers; and facilitating learners' articulation and justification of their own judgements.

Sustainable assessment empowers learners to take ownership of their learning journey, developing their ability to evaluate quality, analyse the merits of diverse ideas and approaches, and gain exposure to a wide range of perspectives. These skills are inherently future-oriented, preparing learners for the complexities of an ever-evolving world.



Sustainable assessment empowers learners to take ownership of their learning journey, developing their ability to make independent judgements about the quality of their own work and that of others.

CONCLUSION

Emergent and complex challenges will continue to demand learning agility and performance agility from Singapore's adult learners. Conventional methods grounded in **Reproducing Knowledge** and **Distributed Knowing** remain valuable but are, on their own, insufficient to cultivate the agility required for novel, uncertain and unknown scenarios.

The imperative lies in **Dynamic Generative Knowing**, and in the adoption of Future-Oriented Pedagogies to develop learners who are strong in critical thinking, flexible in adapting knowledge and skills in new and dynamic contexts, and capable of co-creating value in collaboration with others.

REFERENCES

- Akkerman, S. F., & Bakker, A. (2011). Boundary crossing and boundary objects. Review of educational research, 81(2), 132-169.
- Bound, H. (2024). Future Oriented Pedagogies – FOP Research Note 1. Singapore: Institute for Adult Learning. <https://www.ial.edu.sg/getmedia/25511c89-b3a5-4760-9cb2-ed78415814f7/Future-oriented-Pedagogies.pdf>
- Boud, D. (2000). Sustainable assessment: rethinking assessment for the learning society. Studies in Continuing Education, 22(2), 151-167.
- Boud, D., & Falchikov, N. (2007). Developing assessment for informing judgement. In D. Boud & N. Falchikov (Eds.), Rethinking assessment in higher education: learning for the longer term (pp. 181-197). London: Routledge.
- Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. Journal of Education and Work, 14(1), 133-156.
- Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. Psychological Review, 100(3), 363-406.
- Petta, K., Smith, R., Chaseling, M., & Markopoulos, C. (2019). Generative dialogue: A concept analysis. Management in Education, 33(2), 53-61.

IAL Research Division

We champion applied and innovative research grounded in academic rigour to provide a strong knowledge base for the development of practice in CET, sustainable economic and workforce performance, and informed policies and practices. Using interdisciplinary approaches employing both quantitative and qualitative techniques, the research covers CET system design and practices, adult education, lifelong learning, jobs, skills, careers, labour market issues, pedagogy, andragogy, and praxis, among others.

The views and analysis presented in this Research Note are those of the authors as researchers. The content of the Research Notes is intended for discussions and generating ideas. They are not necessarily the views or policy prescriptions of the Institute for Adult Learning (IAL) or the Singapore University of Social Sciences (SUSS).

This publication should be attributed as Renee TAN and Priscilla PANG (2026). Future Oriented Pedagogies – Key Ideas for Developing Future-Ready Learners. Singapore: Institute for Adult Learning.

This publication remains the copyright of IAL, Singapore and may not be reproduced without the permission of the Director of Research, IAL. For further information on this publication, please email to research@ial.edu.sg

For more information, see <http://www.ial.edu.sg>

Copyright © 2026 Institute for Adult Learning