



Innovation and Entrepreneurship Initiatives

Innovation and Learning Practice

Bridging Innovation and Learning in TVET (BILT) Project

Submitted by Temasek Polytechnic, Singapore

‘Every student is a unicorn’ goes the saying at Temasek Polytechnic in Singapore. To broaden students’ entrepreneurial horizons beyond the concept of chasing ‘unicorn’ start-ups, Temasek’s approach to innovation and entrepreneurship focuses on equipping students with competencies for innovative thinking and developing entrepreneurial mindsets.

Start date: October 2018

Type of implementing institution: Training provider

Target group: Temasek Polytechnic students

Temasek Polytechnic, Singapore

Established in 1990, Temasek is one of the leading institutions of higher learning in Singapore. It offers full-time diploma courses in the areas of applied science, business, design, engineering, humanities and social sciences, as well as informatics and IT. It also offers part-time courses up to the advanced diploma level. Students enter a holistic learning system that combines hands-on experience, character education and relevant life skills in an enriching learning environment.

Description of activities

Temasek's innovation and entrepreneurship initiative aims to develop an innovative mindset and an entrepreneurial spirit in students. This includes the ability to see opportunities in adversity, to be bold and take calculated risks, and the ability to embrace mistakes and use them as a platform to spring forward.

By focusing on core skills such as critical thinking and active learning, Temasek is pivoting away from traditional entrepreneurship training that often focuses on developing business opportunities. Instead, Temasek embraces transversal skills that have increasing value in the working world.

The programme is divided into three phases:

- **Discover** phase, a fundamental curriculum on innovation and entrepreneurship for all students
- **Develop** phase, leveraging current curriculum structure to provide skills-deepening programmes
- **Dive** phase, a structured incubation programme after graduation

Relevance

What is the role of innovation and entrepreneurship?

In the transition to Industry 4.0, many jobs will progressively become obsolete, replaced by a new suite of jobs that require higher-level skill sets. Employers are beginning to recruit and work with people who possess

crucial horizontal skills that complement technical know-how. By developing a basic set of innovation and entrepreneurial skills among all students, Temasek prepares them to adapt and thrive in the modern economy, whether they pursue traditional employment or advance to later stages of the programme and start businesses.

Why focus on an entrepreneurial mindset rather than entrepreneurship?

An entrepreneurial and innovative mindset benefits students in life and in any career that they choose. Skills such as overcoming the fear of failure, pushing boundaries, creative problem solving, capitalizing on opportunities and perseverance are not only useful across career paths, but they are also in demand. Life-long learners, future-oriented creators and value-centred leaders are desired members of the workforce in Singapore, and Temasek recognizes that developing these skills is valuable to both the start-up scene and the traditional workforce.

Added value

What is the benefit of a fundamental innovation and entrepreneurship curriculum for all students?

With its INNOVA fundamental curriculum, Temasek provides students with an appreciation for the relevance of innovation and entrepreneurship at every stage of their future careers. This foundation module is compulsory for all disciplines. The subject matter is curated from industry input and addresses real-world business problems. Other potential problem-solving starting points are derived from the sustainable development goals and current widespread issues facing local or regional communities.

How does innovation and entrepreneurship training enhance diploma curricula?

In the development phase, students explore makerspace prototyping skills (such as 3D-printing), deepen business fundamentals and hone critical core skills (including ideation, problem solving and adaptability). Innovation and entrepreneurship lessons are tightly woven into the curricula for students' main diploma programme, with opportunities to leverage white space learning periods purposefully included in each semester for exploring subjects beyond their disciplines.

What support is available to students who are committed to starting a business?

The 'dive' phase is an **incubation programme** that includes acquisition of fundamental knowledge (such as digitalization), structured mentorship, and the provision of makerspace/prototyping facilities. This part of the curriculum was developed with stakeholders including established entrepreneurs, intrapreneurs, venture capitalists and student alumni. Temasek also actively monitors the availability of government grants, venture capitalist funding, and 'angel investments' from start-up mentors and connects students to these opportunities. Several Temasek start-ups have obtained national seed funding of \$50,000 each. The institution has published a compilation of 20 alumni entrepreneur success stories called '**Bold**'.

Transferability

What elements of the innovation and entrepreneurship curricula are easiest to transfer?

The three-tiered approach (discover, deepen, dive) is a good place to start for an institution looking to establish or enhance innovation and entrepreneurship curricula. The makerspace facilities undergo regular refresh to have a broad range of relevant prototyping equipment. Nevertheless, as no makerspace can provide an exhaustive suite of tools, it is important to work with the community and partners to increase collective bench strength and capability. In any circumstance, the Temasek approach to adding fundamental innovation and entrepreneurship competencies to all diploma programmes is replicable and encouraged.

What traits are desirable from industry partners for innovation and entrepreneurship training?

The most effective industry partners for all levels of Temasek's innovation and entrepreneurship are those who practice innovation in their daily operational work and who use the fundamental tools and processes, such as design thinking, to turn adversity into opportunity. Such role models inspire the students by living the fundamentals shared in the curricula. Temasek also looks out for partners who are open to 'sandbox' projects for testing new ideas. Industry partners also serve on Temasek's Innovation and Entrepreneurship Advisory Committee – a similar structure can help secure managerial buy-in in contexts where the concept of innovation and entrepreneurial curricula is less familiar.

Temasek's Innovation and Entrepreneurship Initiatives is one of the BILT project's Innovation and Learning Practices that address systemic challenges within the five work streams of the project. Specifically, the Temasek's initiative addresses entrepreneurship in TVET:



Entrepreneurship in TVET

Unlocking the potential of innovative entrepreneurial activities and fostering entrepreneurial culture

Additional Innovation and Learning Practices cover the following areas:



New Qualifications and Competencies



Digitalization in TVET



Greening TVET



Migration and TVET

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For more information about this practice:

Temasek Innovation and Entrepreneurship

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About the BILT Project

UNESCO-UNEVOC's Bridging Innovation and Learning in TVET (BILT) project is a reference point for innovation and learning in TVET. It utilizes the international UNEVOC Network to create opportunities for collaboration and a platform for bridging innovation and learning between Europe, Africa and the Asia-Pacific region. BILT complements developments at the national level in supporting innovative, market-oriented and attractive modes of learning and cooperation in TVET.

The BILT project explores the process of identifying, integrating and implementing new qualifications and competencies in TVET. This is known as the 'three I's process'. In addition to the broad focus on new qualifications and competencies, BILT addresses four complementary themes: Digitalization and TVET, Greening TVET, Entrepreneurship in TVET, and Migration and TVET.

For more information, please visit

www.unevoc.unesco.org/bilt

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New Qualifications and Competencies in TVET

- **Identifying** new qualifications and competencies in a timely manner;
- **Integrating** them into appealing and flexible curricula and training regulations; and
- **Implementing** them in innovative training approaches

Entrepreneurship in TVET

Unlocking the potential of innovative entrepreneurial activities and fostering entrepreneurial culture

Greening TVET

Responding to new development paradigms for sustainability and reduced environmental impact

Digitalization in TVET

Providing response to new skills demands, as technology has permeated the world of work and is changing the profile of jobs

Migration and TVET

Accelerating the integration of migrants into their host communities, and allowing them to become productive members of the workforce

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