



Charting the Future of Design Education

A Report by the Design Education Review Committee

Foreword by Chairman

Design Education Review Committee

To realise the Design 2025 Masterplan vision for Singapore to become a thriving innovation-driven economy and a loveable city by design, the Design Education Review Committee (DERC) was appointed in August 2017 by the Ministry of Communications and Information to look into strengthening design higher education and embedding design in non-design higher education in Singapore.

My committee comprised more than 30 members from diverse backgrounds, including representatives from design and non-design companies, public sector agencies, and Institutes of Higher Learning. Their perspectives provided a holistic review of the design higher education landscape in Singapore. This led to relevant and robust recommendations that address business and workforce needs, informed by the findings from the National Design Industry and Manpower Study, commissioned by the DesignSingapore Council. In developing its recommendations, the DERC also actively engaged various stakeholders through interviews and focus group discussions.

With more businesses and government agencies adopting design to innovate their products and services as a competitive edge, we must continue to invest in our design talent to be equipped with transdisciplinary skillsets. Future-ready design talent will not only seize new opportunities in the global market, they will also help create new value for Singapore.

More Singaporeans can also benefit from design-led creative thinking skills. This can be achieved through embedding design into the national mindset as an essential life skill. This will help us as individuals and collectively, as a nation, to better navigate complex problems in the volatile, uncertain, complex, and ambiguous world.

To achieve the above, the DERC has proposed five key recommendations that call for close partnerships with the industry, education institutions and public sector agencies. The first is to strengthen industry links through a Design Education Advisory Committee. The second focuses on imparting design-led creative thinking skills across more disciplines. The third is to support continuing education and training for design educators and professionals. The fourth looks at creating real-world design learning platforms for professionals, while the fifth is about empowering everyone to learn design through modular courses and learning communities.

With these recommendations, we believe that our design higher education system will continue to serve as one of the key levers for Singapore's next stage of economic transformation.

The DERC is deeply honoured to have had the opportunity to be part of this process to help shape and contribute to Singapore as a Nation by Design.

Thank you.



Mr Tan Pheng Hock
Chairman
Design Education Review Committee

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List of abbreviations

CET	Continuing Education and Training
DERC	Design Education Review Committee
Dsg	DesignSingapore Council
IHLs	Institutes of Higher Learning
SAC	School Advisory Committee
SSC	SkillsFuture Sector Coordinators
ITE	Institute of Technical Education
LASALLE	LASALLE College of the Arts
NAFA	Nanyang Academy of Fine Arts
NP	Ngee Ann Polytechnic
NYP	Nanyang Polytechnic
NTU	Nanyang Technological University
NUS	National University of Singapore
PET	Pre-Employment Training
RP	Republic Polytechnic
SFwD	Skills Framework for Design
SIT	Singapore Institute of Technology
SMU	Singapore Management University
SP	Singapore Polytechnic
SUSS	Singapore University of Social Sciences
SUTD	Singapore University of Technology and Design
TP	Temasek Polytechnic

Definition of terms

Design Specialist, Design Integrator, Design Multiplier and Designpreneur

These four archetypes of designers are based on a model developed by the DesignSingapore Council to understand the different roles of designers and the skills that each has:



Design Specialists

Educated and trained in design, such designers have specialised technical skillsets in respective design domains, for example, as product designers or architects.



Design Integrators

Designers who have skills that go beyond the technical design domains, such as change management, process design and organisational design. They are capable of facilitating organisational innovation by design and can help a company innovate and develop holistic customer experiences across business units.



Design Multipliers

Advocates of design who are specialists in a non-design domain. They can apply design in their domain of work to improve a company's processes.



Designpreneurs

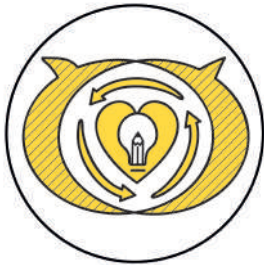
Owners or business developers of design products or brands who balance design sensibilities with strong business acumen. They have entrepreneurial capabilities to lead the business development of products or brands, and are custodians of design businesses.

Design-led Creative Thinking and Design Sensibilities



Design-led Creative Thinking

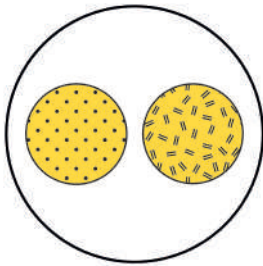
A human-centred approach to solving problems by focusing on empathy, ideation and experimentation. It enables us to creatively tackle challenges that are ill-defined or unknown through an iterative process by understanding human needs involved, reframing problems, developing ideas, and testing solutions.



Design Sensibilities

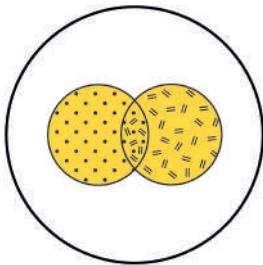
The ability to tap into intuition to make sense of our surroundings, and to communicate ideas and solutions that are relatable to others.

Multidisciplinary, Interdisciplinary and Transdisciplinary



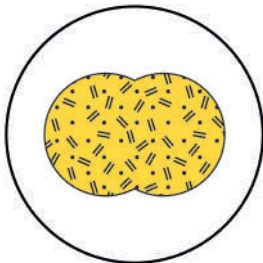
Multidisciplinary

Situations in which several disciplines cooperate but remain unchanged.



Interdisciplinary

To integrate or synthesise perspectives from several disciplines.



Transdisciplinary

The transcendence of disciplinary norms, sometimes in the pursuit of a fusion of disciplines. This approach is oriented to complexity or real-world problem solving and results in innovation and creation of new value.

Place-making, Object-making, Image-making and Experience-making

The DesignSingapore Council defines the economic contributions of the design sector as constituting active firms that provide design consultancy in the following sub-sectors:



Place-making

Architecture Services, Landscape Design and Landscape Architecture, and Interior Design.



Object-making

Industrial and Product Design, and Fashion Design.



Image-making

Advertising, and Art and Graphic Design.



Experience-making

Design Strategy, Service Design, User Interface/User Experience (UI/UX) Design and Design Research.

Executive summary

1. In an ideas-driven economy, those who can overcome existing paradigms to enable economic and social innovation will lead the way. Design drives innovation by creating new value and markets, spurring economic competitiveness, as well as by offering a human-centred approach to tackling societal challenges. Design also shapes our national identity, making Singapore both a liveable and loveable city.
2. A workforce that is skilled in design can play an instrumental role in enabling our companies to remain competitive through innovation in the midst of industry transformation. A vibrant design education system across Pre-Employment Training and Continuing Education and Training (CET) contexts is essential in equipping Singaporeans with the awareness and ability to use design.
3. Over the last five decades, design education in Singapore has contributed to the growth of a workforce with many well-trained design specialists and design entrepreneurs. However, the future economy requires more designers who can integrate knowledge and methods from different design disciplines, and operate in non-design contexts. Beyond designers, we also need non-designers who are equipped with design-related skills to enable innovation in the workplace. Design education in Singapore will need to be continually updated to build up such a workforce.
4. In August 2017, the Ministry of Communications and Information appointed the Design Education Review Committee (DERC) to propose strategies that Institutes of Higher Learning (IHLs) could adopt to strengthen their design education programmes, and to embed design in their non-design education programmes. The committee is chaired by Mr. Tan Pheng Hock, and comprises key employers, education institutions and public service agencies.
5. The DERC envisions that by 2025, Singapore will have more innovative and flexible ways for people to learn about design, facilitated by design educators who are up-to-date with the latest industry needs and developments. Such a design education system will nurture generations of citizens who are able to leverage design to improve the lives of fellow Singaporeans and contribute to our community and economy. To realise this vision, the DERC proposes five recommendations.

RECOMMENDATION 1

Strengthen industry links through a Design Education Advisory Committee

6. The design curriculum of the future must be agile enough to adapt to, and capitalise on economic and industry shifts. The IHLs understand this and have put in place systems and processes that enable them to identify and respond quickly to industry and global trends. These efforts can be strengthened by increasing the access of IHLs to industry experts from design and non-design industries, and to draw on their insights to inform curriculum development and review.

a. Strengthen education and industry links

7. The DERC recommends the formation of a Design Education Advisory Committee (DEAC) which will comprise key industry leaders from design and non-design sectors, representatives from public service agencies, and international thought leaders.
8. The DEAC will offer the IHLs another touchpoint to regularly obtain information about the latest industry trends and emerging skills needed by the industry. These perspectives and insights can inform the development of programmes at the IHLs, ensuring that programmes remain relevant and future-ready. The DEAC can also provide IHLs with additional resources and opportunities for collaboration with the industry to help enrich students' learning experience.

b. Align programmes with industry needs through the Skills Framework for Design

9. The DERC recommends that the DEAC provides advice to the IHLs on the application of the recently developed Skills Framework for Design (SFwD) to their programmes. This framework identifies the jobs required by the future economy, which include emerging design roles in non-design industries, and the skillsets needed for professionals to move into them. The DEAC will be well-placed to advise the IHLs on the skills required of design graduates at different levels of study, taking reference from the SFwD.

RECOMMENDATION 2

Impart design-led creative thinking to students across more disciplines

10. Unlike the linearity of the conventional way of problem-solving, design-led creative thinking, such as the design thinking process, is iterative in nature. It helps nurture a mindset in users that prototyping and repeated experimentation is a necessary step in improvement rather than a point of failure. This ability to rapidly innovate solutions to complex issues will increasingly become essential, making design-led creative thinking a valuable and relevant life skill.

11. Design-led creative thinking can be learnt most effectively through transdisciplinary collaborations when practitioners of different disciplines work together to understand, ideate, and experiment to solve real-world problems. Many IHLs offer transdisciplinary platforms and programmes that support the learning and cultivation of design-led creative thinking. Examples include the Singapore University of Technology and Design's Design Odyssey programme, and the Singapore Management University's SMU-X programme.

a. Promote transdisciplinary platforms to cultivate design-led creative thinking

12. The DERC recommends that IHLs build on their existing efforts and incorporate programmes and platforms for students from different schools to learn and practise design-led creative thinking together within their core curriculum.

Pilot Programme: "Let's Design Together"

13. Singapore Polytechnic will pilot a programme called "Let's Design Together", through an elective module in the new academic year starting in October 2019. This credit-bearing, semester-long programme brings together students from the polytechnic's different participating schools to solve real-world issues through design-led approaches with industry partners. Findings from this pilot will be shared with other IHLs for consideration, should they wish to incorporate a similar platform within their core curriculum.

RECOMMENDATION 3

Support Continuing Education and Training for design professionals and educators

14. Organisational processes and services are being redesigned in the midst of economic and industry transformation, presenting new opportunities for design professionals. Non-design industries are expected to increase their employment of designers significantly in the next five years as they leverage design to stay competitive. Design professionals need to be transdisciplinary and operate beyond design disciplines as Design Integrators to seize opportunities in areas of emerging growth and employment demand. These areas are found at the intersections of design, business and technology, such as in Business Design, Service or Experience Design, Strategic Design and Design Research.
15. In addition, changes in technology and trends in automation require the workforce to continually upgrade their skillsets to stay relevant. It is imperative for design professionals to develop and hone strategic, management, analytical and communication skills in order to function beyond single-discipline job roles. CET for design professionals is thus critical to enable them to seize new employment opportunities, and to create new value for businesses and the economy.

a. Deepen strategic, management, analytical and communication skills through enhanced CET programmes and incentives for design professionals to take on the role of a “Design Integrator”

16. The DERC recommends that CET programmes and incentives be enhanced to support the deepening of strategic, management, analytical and communication skills for design professionals. Currently, individuals can tap into a range of CET programmes and incentives such as the DesignSingapore Scholarship and SkillsFuture Study Awards, as well as the Workforce Singapore’s Professional Conversion Programmes which is targeted at Professionals, Managers, Executives and Technicians, including mid-career switchers, to undergo skills conversion and move into new occupations and progress vertically within the design field, or laterally into other industries. More DesignSingapore Scholarships and SkillsFuture Study Awards for the design sector may be awarded to individuals who have an interest in acquiring non-design skills that help them become Design Integrators. CET training providers can take reference from the SFwD to develop CET programmes that meet the skills gap and needs of the design and non-design sectors.

b. Support design educators to maintain industry relevance through a skills competency matrix

17. Design educators and CET trainers will also need to stay up-to-date with the latest industry trends and pedagogical practices. To guide their professional development, the DERC recommends that a skills competency matrix be developed for them. A new track focusing on Education could be included in the SFwD, which currently covers the four tracks of Design, Business, Innovation and Technology. Apart from providing clarity on the skills that design educators and CET trainers need to perform their roles, the matrix will also guide other design professionals who are interested in working as educators and CET trainers. The DERC believes that the proposed DEAC will be well-placed to advise on the development of this matrix.
18. The DERC also recommends expanding the focus areas of the SkillsFuture Study Awards for the design sector to include design educators and CET trainers. This will better support their professional development and help to groom the future leaders of design education in Singapore.

RECOMMENDATION 4

Create real-world design learning platforms for professionals

19. Design-led creative thinking is useful in helping individuals adopt a human-centred approach when designing solutions to challenges and problems. Mastery of such a skill requires practice.

a. Enable real-world design learning beyond the formal curriculum

20. The DERC recommends the creation of more real-world learning platforms where professionals can come together to deepen their learning of design-led creative thinking and hone their skills by devising possible solutions to social and economic challenges. One way to support this is through creating experiential learning spaces—physical or virtual—where professionals can learn design-led creative thinking skills and apply it to real-world situations together. These can be facilitated by designers and experts in design-led creative thinking.

Pilot Programme: “School of X”

21. The DesignSingapore Council (Dsg) will launch a pilot real-world open learning platform to offer professionals the opportunities to learn and practise design thinking, and to co-create solutions for the community. Called the “School of X”, it will bring together both the private and public sectors to tackle complex social and economic issues that can benefit from a design-led creative thinking approach. Through such experiences, participants will better appreciate design as a framework and develop a mindset for creative problem-solving, beyond solely being a tool for aesthetics. Instead of being formally assessed on how they approach the challenges, participants will learn from feedback from fellow collaborators and facilitators.
22. To ensure sustainability and growth, the Dsg will develop the framework for the “School of X”, which the DERC hopes can be adopted by other organisations to offer their own real-world design learning platforms.

RECOMMENDATION 5

Empower everyone to learn design through modular courses and learning communities

23. In line with the Design 2025 vision of developing design as a national skillset, more opportunities can be created for the public to learn and apply design-led creative thinking. While there are many existing design programmes offered by the IHLs and other training providers, these are typically focused on preparing professional designers for work. New courses and programmes with lower barriers to entry will provide opportunities for more people, including those without design backgrounds, to learn about design and develop design sensibilities. This can be part of the range of lifelong learning opportunities offered through modular courses in the SkillsFuture Series.

a. Create more modular courses in emerging design domain areas

24. The DERC recommends that more modular courses in emerging design domains be offered to individuals at all stages of learning—from beginner to intermediate to advanced

levels—to learn critical skills in design concepts and design literacy. This is particularly so in the domains of Service or Experience Design, Business Design, Strategic Design and Design Research. A variety of modular courses in design offer individuals the flexibility to make decisions based on their needs and interests.

b. Promote lifelong learning in design

25. It takes time to acquire knowledge and subject matter expertise in design. The DERC recommends that efforts in promoting lifelong learning in design skillsets be ramped up through ground-up learning communities throughout Singapore. These communities will serve as a space for people to exchange ideas and inspire one another to learn about design. In addition, the DERC recommends leveraging existing national movements such as the SkillsFuture Festival to raise public awareness of design as an important life skill. By developing a culture of lifelong learning, different groups of people—from the general public to design experts—can learn about and appreciate design and its application in real-world contexts.

Advancing design education in Singapore together

26. This report outlines strategies to help all Singaporeans appreciate the value of design and apply it to their work and everyday lives through education and training. The DERC hopes that these recommendations will help further develop Singapore’s design education system to offer innovative ways for all to learn design, with high-quality programmes that are facilitated by forward-looking and industry-relevant design educators and CET trainers. Realisation of these strategies requires key stakeholders, including the IHLs, public service agencies, and industry to come together. Singaporeans must also take ownership of their personal education. As more citizens appreciate design as an important skillset rather than purely an aesthetic discipline, it will help bring the economy to the cutting-edge of innovation and make Singapore a more liveable and loveable city.

INTRODUCTION

Charting the future of design education

Vision 2025: An innovation-driven economy and a loveable city

- i. The year is 2025. Singapore is a thriving innovation-driven economy and a loveable city. Companies are adept at reinventing themselves to seize new opportunities, and individuals are capable of devising design-led creative thinking approaches to meet social and economic needs. Driving this transformation is a workforce equipped with design as a national skillset. Designers and non-designers alike are able to appreciate the value of design, and harness it to create new value propositions, tackle complex issues, and improve the quality of life. Design is embedded in our society through these two aspects:
 - **Design talent with transdisciplinary skillset**

Designers who not only excel in specialist design domains, but also possess skillsets in non-design disciplines such as business and technology. They are able to draw on their knowledge of multiple domains, and integrate them to create new products and services that meet industry needs.
 - **A workforce with design sensibilities**

Working professionals who possess design sensibilities and have the ability to apply design-led creative thinking approaches to solve complex issues. They can drive business transformation and co-create better living environments.
- ii. Undergirding these developments is a strong design education system that provides innovative and flexible ways for people to learn about design in educational institutions and beyond the formal curriculum. In addition, design educators are well-informed of the latest industry trends because they have multiple touchpoints with the industry. They are able to facilitate in-depth learning in design domains and other emerging non-design disciplines.

Preparing the design workforce of the future

- iii. Design 2025 vision can be realised if we recognise and respond to the evolving role of designers. Previously, designers were hired to package the look and feel of a company's products and services. Today, they are increasingly sought after by a range of industries and public service agencies to create strategic competitive advantages, and to help companies respond more nimbly to market opportunities by transforming systems, experiences and organisations.

Five trends in the design industry landscape

- iv. In focus group discussions conducted by the DesignSingapore Council (Dsg) and SkillsFuture Singapore (SSG), with industry members to formulate the Skills Framework for Design (SFwD)¹, five trends emerged that reflect how the function of design has changed:

1. Design as Catalysts

Companies are integrating designers into teams with engineers and developers to create new value for businesses. To serve as catalysts for value creation, designers need to possess deep knowledge not only in the craft of design, but also in business and technology. This helps them take on strategic and managerial roles too.

2. Cultural and Organisational Transformation

Organisations are increasingly championing a more collaborative working culture based on empathy and communication. Designers play an important role in facilitating the development of human-centred problem-solving approaches to shape organisational culture.

3. Systems Approach to Complexities

Businesses are recognising the value of design in navigating complex systems, interfaces and environments in order to optimise performance. Designers must better understand cultural nuances, relationships and the human psyche in order to deliver thoughtful and meaningful experiences.

4. Design for New Technological Platforms

As machines become more ubiquitous in our lives, there is a growing trend of delivering more human-centric and immersive end-to-end experiences. Designers are expected to be agile and versatile enough to design for omnichannels². They must exercise empathy in order to create seamless solutions in a fast-evolving technological landscape.

¹ The Skills Framework is an integral component of the Industry Transformation Maps and it is co-created by Employers, Industry Associations, Education Institutions, Unions and Government for the Singapore workforce. It aims to create a common skills language for individuals, employers and training providers. The SFwD provides key information on sectors, career pathways, occupations, job roles, as well as existing and emerging skills required for design occupations and job roles. For more information, please see <https://www.skillsfuture.sg/skills-framework/design>

² Omnichannel is a cross-platform content strategy that organisations use to improve their user experience. Rather than working in silo, these platforms are designed to integrate and cooperate. For example, an integrated retail experience is created from shopping online, on mobile applications, and from the interactions and exchanges that take place in the physical stores.

5. Sustainability and Ethics

In an increasingly complex world, discussions on the ethical implications of design are more pressing than ever. Designers must be proficient in regulations governing data privacy, intellectual property, sustainability, diversity, inclusivity and accessibility.

The four archetypes of designers

v. The five trends will have an impact on the design industry manpower landscape in Singapore. Currently, designers mainly work in four areas of the design sector:



Design Domain Knowledge ————— Non-design Domain Knowledge

The four archetypes of designers

- Place-making (e.g. Architecture and Environmental Design), Object-making (e.g. Industrial and Product Design), Image-making (e.g. Advertising and Visual Communications) and Experience-making (e.g. Service Design and User Interface/User Experience [UI/UX] Design). Designers are also employed in the non-design sectors, typically within in-house design teams or management teams. Dsg has developed a model outlining the four archetypes of designers and the skills that each possesses:
- vi. Between 2017 and 2022, it is estimated that 12,000 new design jobs will be created in Singapore and the archetypes required will be in the ratio of 4:2:1 (Design Specialist: Design Integrator: Design Multiplier). The fastest growth in demand will be for Design Integrators³. As businesses increasingly use design to transform their organisations, Singapore needs designers who transcend the traditional role of Design Specialists or Designpreneurs to operate in non-design contexts. Design Integrators marry their core expertise in design with relevant non-design skills and deep industry knowledge. Beyond designers, we also need Design Multipliers. They are non-designers skilled in other domains but who are equipped with transferable design-related skillsets that can be tapped on to fuel innovation in the workplace.
 - vii. The five trends in the design industry and the growth in demand for emerging design roles, suggest a fast-changing employment landscape. All individuals need adaptive skillsets to remain versatile in such an environment. The key to embedding design skillsets across different areas in our society is to enhance Singapore's design education system across the Pre-Employment Training (PET) and Continuing Education and Training (CET) space.

Reimagining design higher education in Singapore

A review of Singapore's design higher education landscape

- viii. Since the 1960s, Singapore has leveraged design to drive industry transformation and to develop its competitive edge. One of the first national design schools, the Baharuddin Vocational Institute, was established in 1968 as a technical and applied arts college offering professional pathways in fields such as commercial art, handicraft, fashion, printing, and woodworking. Over the next two decades, design gained an increasingly prominent role in Singapore and started featuring in the mainstream education system. In the late 1980s, the Economic Development Board and the then-Trade Development Board (now Enterprise Singapore) began facilitating the development of industrial design to help local businesses internationalise. As part of the evolution of Singapore's industrial and trade landscape, the design education system was expanded with the establishment of design schools within the polytechnic system.
- ix. Today, the design higher education landscape is made up of more than 70 PET design courses offered across six Autonomous Universities (AUs), five polytechnics, the Institute of Technical Education (ITE) and two Arts Institutions (AIs)—LASALLE College

³ Based on findings from National Design Industry and Manpower Study 2017.

of the Arts (LASELLE) and the Nanyang Academy of Fine Arts (NAFA). (See Appendix)⁴. This network of institutions has nurtured the bulk of Singapore’s design workforce over the decades, which today numbers some 38,500 professionals across all industries⁵.

- x. Over the last five decades, design education in Singapore has contributed to the growth of a workforce of Design Specialists with deep technical expertise. However, the future economy requires more Design Integrators who can integrate knowledge from different disciplines into the work they do. More non-designers who are equipped with design-related skills are also needed to drive innovation in the workplace as Design Multipliers. The design education system will need to be continually enhanced to build up such a workforce.

The Design Education Review Committee

- xi. In August 2017, the Ministry of Communications and Information (MCI) appointed the Design Education Review Committee (DERC) to look into strengthening the design education system in Singapore. The DERC chaired by Mr. Tan Pheng Hock, comprises key industry players, Institutes of Higher Learning (IHLs), and public service agencies (see “Acknowledgements” for a full list of members).
- xii. The DERC was tasked to propose strategies to:
- **Strengthen Singapore’s design higher education by enhancing existing design programmes in the IHLs; and**
 - **Embed design in Singapore’s non-design higher education to increase the appreciation and use of design across different disciplines.**
- xiii. The DERC adopted a design thinking approach to review Singapore’s design higher education, and supported their findings with in-depth research. Two sub-workgroups were established, consisting of more than 30 members from the design industry, employers of designers, academics, as well as school leaders from the AUs, polytechnics and the AIs.
- xiv. The insights and ideas gathered from four sessions of discussion on selected topics were then developed into prototypes with committed partnership. In addition, over 40 interviews and focus group discussions were conducted with individuals from the design education system to delve into the issues surfaced from the DERC discussions. These interviews and focus group discussions also highlighted potential challenges in implementing the DERC’s preliminary recommendations.
- xv. The detailed study conducted by the DERC was also informed by findings from the concurrent National Design Industry and Manpower Study (NDIMS) in 2017, and the

4 Based on data from the Ministry of Education (MOE). This excludes engineering and media related design programmes.

5 Based on findings from National Design Industry and Manpower Study 2017 and the MOE’s Graduate Employment Survey 2016.

INTRODUCTION

SFwD which was developed in 2018. Both initiatives provide comprehensive analyses on Singapore's design manpower landscape, as well as the industry trends and employment outlooks in both the design and non-design sectors.

- xvi. This report details five recommendations put forth by the DERC to enhance design higher education in Singapore. They are:

RECOMMENDATION 1

Strengthen industry links through a Design Education Advisory Committee

RECOMMENDATION 2

Impart design-led creative thinking skills to students across more disciplines

RECOMMENDATION 3

Support Continuing Education and Training for design professionals and educators

RECOMMENDATION 4

Create real-world design learning platforms for professionals

RECOMMENDATION 5

Empower everyone to learn about design through modular courses and learning communities

- xvii. Some of these recommendations are tied to pilot programmes that the Dsg will work with partners to prototype, test and refine. In developing these recommendations, the DERC took into account existing efforts by the IHLs and various stakeholders in education to infuse design into higher education curriculum and programmes. The DERC hopes that these efforts will be built on to develop a design education system that meets the evolving manpower needs of the future economy and propel Singapore into a hub for design education in Asia and around the world.

DESIGN 2025 VISION

Singapore to be a thriving innovation-driven economy and a loveable city by design

WE WANT

A global, resilient workforce that will use design to help Singapore thrive in the future economy. We need a workforce that:

- Consists of design talent with transdisciplinary skillsets
- Possesses design sensibilities for the wider economy

WE NEED

A sustainable design education system to nurture a pipeline of talent. We need Institutes of Higher Learning and training providers that:

- Provide more innovative and flexible ways of learning
- Support the professional development of design educators

5 RECOMMENDATIONS

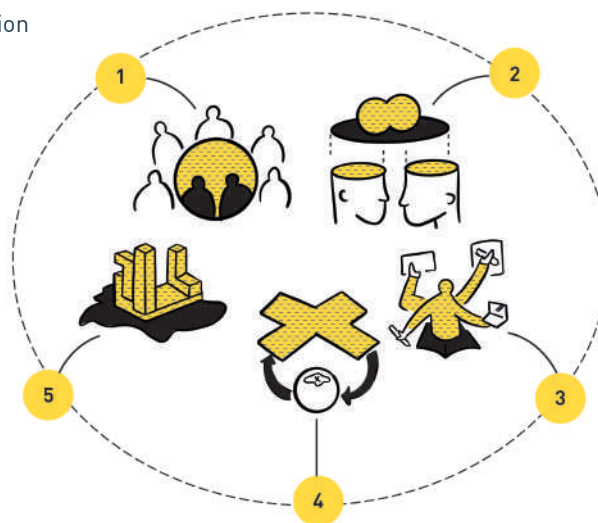
to achieve an enhanced design education system

Strengthen industry links through a Design Education Advisory Committee

Impart design-led creative thinking skills to students across more disciplines

Empower everyone to learn about design through modular courses and learning communities

Support Continuing Education and Training for design professionals and educators



Create real-world design learning platforms for professionals

Talent with transdisciplinary skillsets

By 2025, our designers will not only excel in specialist design domains, but will also possess skillsets that transcend disciplinary norms. They will bring together knowledge in design and other disciplines to innovate and create new products and services that meet industry needs.

Adrian

A lead designer in a multinational company in his mid-thirties

Leading a team that creates solutions and services for the healthcare industry, Adrian is highly skilled in design and can tailor products and processes that are convincing to his largely non-design stakeholders. To redesign a hospital interior, he used data analytics to measure the impact of his team's work and confirmed it increased the service efficiency of the staff.



Adrian's success in producing a wide range of work that is relevant for the health industry stems from his studies at the product and industrial design programme of a local polytechnic. His parents supported his choice to study design because of Singapore's strong design education programmes. Indeed, Adrian was not only trained by lecturers who were current with the latest industry developments but their experiential learning approach spurred his interest in design further. As part of a course module, he even collaborated with his peers from the schools of business, electrical engineering and health sciences to tackle a challenge set by the industry. The experience demonstrated how design could play a transformative role in other disciplines and ignited Adrian's interest in developing skillsets complementary to design. Upon graduation, he pursued an industrial design degree, and later completed a design Master of Business Administration (MBA), with a minor in design management.

Equipped with skillsets that straddled design and business, Adrian joined a multinational company where he comfortably took on various different portfolios throughout his career. From operations to marketing, he successfully applied design to transform each aspect of the business. This track record of success propelled him to become the company's lead designer today.

Rani

A senior experience designer in a local Small Medium Enterprise in her late twenties

While pursuing a computer science degree at a local university, Rani also took up several design modules—UX Design, Game Design and the Design of Interactive Systems—that counted towards her academic credits. She also had many opportunities to work on design projects. For instance, Rani collaborated with students from the design school on many projects. During an internship, she also coded a game for a popular social media platform and was involved in its design.



The exposure to design was useful when Rani graduated and began freelancing as a web and mobile applications developer. She could successfully mix her computer science knowledge with design principles, and after a year, Rani joined a local Small Medium Enterprise (SME) as a software engineer to develop applications deployed for a base of a few thousand users. With her design experience, she proved useful in taking on tasks that required UI (User Interface) and UX design, as well as providing technical consultancy to the other teams.

Two years into the job, Rani was promoted to be a senior experience designer. This gave her the opportunity to take on a bigger role in design—something which Rani had been developing for years. Leading teams to look into the UI/UX design of the company's products, her background in both computer science and design was a plus. She could provide technical implementation advice to front-end developers and also function as a UI/UX designer.

With such diverse skillsets and versatility, Rani is confident about the future and her options in pursuing a variety of careers in computer science or design.

Talent with design sensibilities for the wider economy

By 2025, the workforce will also possess design sensibilities—the ability to tap into intuition to make sense of our surroundings, and to communicate ideas and solutions that are relatable to others. They will embrace design and use it to transform businesses and co-create better living environments.

Sally

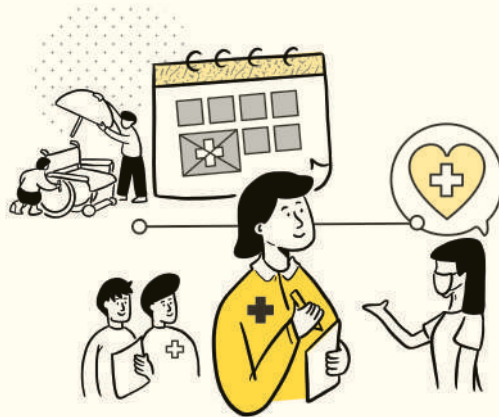
A senior hospital administrator in her early fifties

As a hospital administrator with a heart for patients, Sally has been trying to address the high rates of missed medical appointments. Not only does this make scheduling challenging for her team of administrative executives, missing medical appointments would also be dangerous for the patients.

After hearing about how design can be used to improve lives, she participated in an open innovation platform to learn more. Unlike a formal course, which involves a longer-term commitment, this week-long platform brings together people of different backgrounds to use design approaches to tackle a real-world problem.

Sally learnt the principles of design thinking while working with a group to help the visually impaired more easily navigate the neighbourhood she lives in. The experience helped her understand the perspectives of users, and Sally realised she had long viewed her work issue from an operational perspective. Missed medical appointments reflected more than just gaps in the administrative process, but also the needs of patients. For example, many were late or missed appointments because of difficulties with transportation arrangements. By understanding the needs of the user, her team could develop better solutions that address the root of the problem.

Her fruitful experience got Sally to encourage her colleagues to sign up for the learning platform too. As there are no assessments, she felt freer to experiment with new ideas and could focus on learning and acquiring skills through collaborating with others on an iterative process. Convinced that design can be a powerful tool, Sally has also incorporated this way of working in her job and everyday life.



In 2025, Singapore's design education will nurture future-ready designers. Design educators are well-informed of industry trends and developments as they are practitioners or have accessible touchpoints with industry players. They can also employ innovative approaches to facilitate deeper learning in design, industry developments, and other emerging disciplines such as artificial intelligence.

Faizal

A lecturer of an Experience and Product Design diploma programme in his mid-forties

When Faizal was nominated for an outstanding design educator award, his students not only commended him for his teaching but his knowledge in the latest industry developments. In class, he could bring alive theoretical concepts with real-world examples from his years of working as a designer. Even now, he continues taking on consultancy work and ropes in his students from time to time to partner in projects.

This has helped Faizal's students gain insights into the work of a designer, including the soft skills needed to manage projects, work with clients and communicate effectively.

Prior to joining the polytechnic's design school as a full-time lecturer, Faizal worked for over 15 years as a product designer. The career switch did not mean leaving the industry as he continues to stay abreast with the latest developments through industry sharing and networking sessions. Most recently, he also underwent a two-month attachment with the service design team in a multinational company. This was arranged by the school in recognition of his four years of service—just one of the many opportunities design educators have to develop themselves professionally.

The attachment gave Faizal new insights into his teaching, and he has updated his lesson materials and also offered new ideas during his school's regular curriculum review. In addition to keeping up with the industry, he has also been upgrading himself as an educator by attending courses on pedagogy and curriculum development. By continuously developing himself as both a designer and an educator, Faizal is confident of training his students to become the designers of tomorrow.



RECOMMENDATION 1

Strengthen industry links through a Design Education Advisory Committee

1. A review of design education initiatives in the Institutes of Higher Learning

- 1.1. The DERC recognises that the IHLs have long maintained a close nexus between design curriculum and industry needs. This is done through systems and processes that enable them to stay updated with industry and global trends, and to make timely adjustments to their curriculum. The IHLs are also broadening the scope of the design curriculum by offering modules in core employability and life skills, and organising internships for students to acquire the necessary skillsets and experience to prepare them for work.

Designing a holistic curriculum

- 1.2. Alongside developing design skills and capabilities, the IHLs ensure that design students are prepared for future employability by helping them develop life skills that extend beyond technical competencies. For example, all students at the Nanyang Polytechnic (NYP) have to take Personal Career Strategy (PCS) modules in their first and second year of studies. This equips students with self-management and decision-making skills to attain personal and financial well-being, achieve professional development and career goals, and build positive relationships in life and at work. Students at the ITE undergo a life skills module that uses a project-based learning

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approach to impart communication, collaboration, critical thinking and problem-solving skills. The Ngee Ann Polytechnic (NP) students take at least one module with service-learning as a pedagogy, and they have the opportunity to apply the skills and knowledge on to a community project and effect positive social change. All second-year students from the Singapore Polytechnic (SP) must take a 45-hour institution-wide module, the Social Innovation Project, where they use design thinking methodology to address a local social issue.

- 1.3. Within the formal curriculum, the IHLs also provide opportunities for design students to gain exposure to non-design subjects and adjacent skillsets. At the LASALLE College of the Arts (LASELLE), all degree programme students undertake an interdisciplinary module as part of their course. The curriculum in the Nanyang Academy of Fine Arts (NAFA) allows design students to take subjects such as “Design and Brand Strategy” and “Entrepreneurship in the Arts” to broaden their learning, and to make it more industry-relevant.
- 1.4. In addition to offering electives beyond the design disciplines, the IHLs have also created platforms to enable students from different courses to learn together. Inter-school collaborations at the Republic Polytechnic (RP) take the form of final-year projects and competitions.⁶ At the National University of Singapore (NUS), students from the Industrial Design and Architecture departments engage in joint-department studio collaborations for a semester. The Interdisciplinary Final Year Project (ID-FYP) was recently launched by the Nanyang Technological University (NTU) College of Engineering to enable students from at least two different schools to undertake projects that require overlapping skillsets.

Providing industry touchpoints

- 1.5. Internships and industry attachments give students the opportunity to apply theory to practice. Currently, all IHLs offer internship programmes to their design students.⁷ For example, Nanyang Polytechnic (NYP) School of Design piloted a nine-month internship in 2018 called the “Work-based Learning Programme” in response to the growing adoption of service design for innovation.⁸ The Singapore University of Technology and Design (SUTD) has a Technology Entrepreneurship Programme for students to embark on term-long work immersion experiences in the USA and China.
- 1.6. Besides internship programmes, industry projects are also incorporated into the formal curriculum to deepen design skills and strengthen industry-relevant learning outcomes. An example is the Industry Studio Project (ISP) at the Temasek Polytechnic (TP) where students can collaborate on live projects with industry partners. After the ISP, students

⁶ These projects are typically about 13 weeks long. Some of the competition projects include the Lee Hsien Loong Interactive Design and Media Smart Nation awards, URA's CUBE (Challenge for Urban and Built Environment) awards and the 3D printing awards.

⁷ The duration of a typical work internship programme in ITE is between 10 to 20 weeks, 12 to 22 weeks in the polytechnics, 5 to 16 weeks in the AUs, and 5 to 16 weeks in the AIs.

⁸ Students on this programme worked as designer-cum-service design facilitators in sectors such as Hospitality and Food and Beverage. They facilitated customer journey mapping projects at various departments while undertaking technical design work in print and online mediums.

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undergo an internship programme that could then inform their Final Year Project. TP has also partnered the DDB Tribal Worldwide Asia to launch the Equator, a satellite office in the polytechnic, to provide mentorship, internship programmes and real client projects for students.

- 1.7. The IHLs also offer a range of activities outside of the classroom to ensure learning goes beyond the formal curriculum. ITE, NP and NYP created Maker Spaces for students to apply their design skills to ideate and create new products. In NAFA, “white space”—a common timeslot set aside in the curriculum—enables students from different schools to come together to design and implement interdisciplinary projects. Curricular flexibility is also espoused in TP, where two “flex” weeks in a semester are set aside for students to attend talks and workshops by industry speakers. At NP, design students can also meet alumni entrepreneurs weekly through an Entrepreneur-in-Residence programme. Learning also takes place in the form of co-curricular interest groups in SUTD where there are many clubs that work to acquire design and entrepreneurship skills.⁹
- 1.8. The design faculties in the IHLs have also initiated partnerships with public service agencies, non-governmental organisations, social service organisations, design studios, and industry partners in the non-design sectors, to better understand the value of design in these industries. At the Singapore Institute of Technology (SIT), graduating students of the Communications Design faculty have established working relationships with industry associations and professional bodies such as the Institute of Advertising Singapore and The Design Society, and have the opportunity to meet with them weekly. SIT interior design students have also worked on real-world studio projects with public service agencies, non-profit organisations, and professional association over the years. The design schools in the IHLs also organise graduation shows for design students to showcase their portfolios to potential employers. These initiatives offer students a variety of industry touchpoints to better prepare them to enter the workforce.
- 1.9. To ensure the quality and relevance of the design curriculum, each IHL has an advisory committee to offer guidance and insights on industry needs. Polytechnics also conduct minor reviews of their courses at the end of each semester and hold a major review every three to five years. They work with design industry professionals through their School Advisory Committees (SACs) to ensure that curriculum content remains updated.
- 1.10. Beyond the institution-level efforts of the IHLs, the Ministry of Education (MOE) initiated the establishment of SkillsFuture Sector Coordinators (SSC) for the polytechnics and the ITE to strengthen partnerships and coordinate engagements with industry. The SSC has enabled more industry-relevant opportunities in the form of projects and internships for students. The SSC for Design is led by NYP.

⁹ SUTD offers funding and space allocations to co-curricular clubs centred on Computer-Aided Design (CAD), game design, social innovation or design, and the fabrication of novel Unmanned Aerial Vehicles (UAVs) or drones.

RECOMMENDATION 1**Strengthen industry links through a Design Education Advisory Committee**

- 1.11. The IHLs are doing good work in ensuring that their design curriculum covers a broad range of skills and remains industry-relevant. Their efforts can be further strengthened from a strategic and planning perspective. Currently, most of the SACs are heavily represented by employers from the design sector. The IHLs would benefit from input from employers in the non-design sectors as they are expected to be the drivers of design employment in the future.



Strengthen education and industry links

a. Strengthen education and industry links

- 1.12. The DERC notes the success of the SSCs in the polytechnics and the ITE, and proposes extending a platform to engage industry to the AUs and the AIs. This could be done through the formation of a Design Education Advisory Committee (DEAC) to bring key stakeholders in design higher education and industry together to facilitate partnerships between the IHLs, employers and the government. The DEAC will comprise design industry professionals, key industry leaders from non-design sectors, IHL leaders, representatives from public service agencies, as well as international thought leaders. The committee could advise on how design education initiatives across all the IHLs could be better aligned with evolving industry needs. Its international thought leaders will also offer global perspectives for the benchmarking of the IHL's programmes, and overseas networks and resources for curriculum development. The diverse composition of the DEAC will also augment the SACs by offering views from the non-design sectors and additional information about industry trends and emerging skills needed to thrive in the future economy.
- 1.13. The DEAC can also tighten the nexus between instruction and practice by providing IHLs with additional resources and opportunities for collaboration with industry. For example, it can facilitate local and international opportunities for structured on-the-job training in both the design and non-design sectors. This helps design students gain a better understanding of the range of job opportunities in the evolving design industry manpower landscape in Singapore and abroad. The DEAC can also work with the IHLs and employers to create bridging programmes for graduating design students to network or collaborate with potential employers. This enhances the students' employability and facilitates their transition to the workforce.

b. Leveraging the Skills Framework for Design to align programmes with industry needs

- 1.14. In addition to strengthening industry links, a possible role for the DEAC is to advise IHLs on the application of the recently developed SFwD to their programmes. The framework outlines the skills required of design graduates at the certificate, diploma, degree, and postgraduate levels of study to assume various jobs in the design industry. It also identifies the required roles of a designer in the future economy, both in the design and non-design industries, and the skillsets needed for professionals to move into them. The SFwD is a point of reference to ensure that Pre-Employment Training (PET) is regularly updated and right-sized to meet the evolving demands of the industry. This will also help students appreciate the skills that they acquire in their studies and how it can be applied to work.
- 1.15. The DEAC will also be well-placed to help the IHLs and training providers apply the SFwD to CET design programmes. This ensures a more robust design education system that is industry-relevant across both the PET and CET spaces. It is timely as the polytechnics are streamlining PET and CET course offerings. The DEAC could help the IHLs leverage the SFwD to sharpen curriculum development and guide the process of

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mounting or retiring design courses according to industry needs.

- 1.16. This recommendation will create a seamless pathway from PET to CET in Singapore's design education system across all IHLs, and bolster our vision of being a hub for design education. We recommend the Dsg to be the sectoral agency to lead the formation of the DEAC, in consultation with the MOE, Ministry of Trade and Industry, and SSG. The input from these four agencies will ensure that the DEAC is well-placed to support Singapore's design higher education system in nurturing a future-ready design workforce.

Summary

The DERC's first recommendation is to strengthen the links between the IHLs and industry through the formation of a DEAC. This ensures that the design curriculum remains agile and adaptable enough to capitalise on economic and industry shifts.

This can be done by:

- a. Strengthening education and industry links through the DEAC; and
- b. Aligning programmes with industry needs through the SFwD.

RECOMMENDATION 2

Impart design-led creative thinking skills to students across more disciplines

2. Cultivating design-led creative thinking through transdisciplinary learning

- 2.1. Design-led creative thinking, such as design thinking, is a human-centred approach to problem-solving. It teaches individuals to tackle challenges by empathising with the needs of the target audience, and by learning collaboratively through a dynamic exchange of ideas. Once an understanding of the goals of the target audience is established, ideation and brainstorming take place to generate as many solutions as possible. Selected solutions are then tested through prototyping so that improvements can be made in the final stages of the design thinking process.
- 2.2. Unlike the linearity of the conventional approach to problem-solving, the design-led creative thinking process is iterative in nature. It nurtures in users a critical problem-solving mindset by requiring one to reframe prototyping and repeated experimentation as necessary steps in improvement rather than a point of failure. The ability to rapidly innovate solutions to complex issues will become increasingly essential, making design-led creative thinking not only a critical 21st century competency but also a valuable life skill.¹⁰ However, individuals often view design as a technical skill or a purely aesthetic tool, and fail to recognise its potential to intersect with or bring value to non-design areas.¹¹

¹⁰ See MOE's website for a detailed description of 21st Century Competencies. <https://www.moe.gov.sg/education-system/21st-century-competencies>

¹¹ Based on validation interviews conducted in 2018.

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- 2.3. To raise awareness of the relevance of design today, more individuals can be exposed to the use of design-led creative thinking approaches to solve real-world problems. Within the polytechnics and the ITE, non-design students have the opportunity to learn about design-led creative thinking approaches through institution-wide programmes. In ITE, “Design Thinking” is an elective that is available to all students. All the NP first-year students, RP students from the School of Hospitality, and all TP students take modules to become familiar with the design thinking framework.¹² In SP, in addition to the institution-wide “Social Innovation Project” module,¹³ non-design students can learn about the design thinking process through collaborative projects facilitated by the SP’s User Experience Centre (UXC). The NYP’s “Innovative and Enterprising Foundation Programme” introduces design processes, ideation tools and collaborative practices to all students to enable them to integrate skills learnt in school with those acquired in their industry attachments. Through these modules and programmes, non-design students learn to appreciate the applications of design-led creative thinking within their subject domains.
- 2.4. The Autonomous Universities (AUs) and Arts Institutions (AIs) have also ramped up efforts to embed design into non-design higher education. The new core curriculum at the Singapore Management University (SMU) will feature design thinking as a key component in the academic year starting in August 2019.¹⁴ The NUS also has a university-wide general education module that introduces students to the basics of design and creativity, and acquiring design thinking is one of its key learning objectives.¹⁵ The Singapore University of Social Sciences (SUSS) developed Design-X for non-design students. This semester-long social science project promotes critical inquiry into a range of local issues using interdisciplinary perspectives and integrates a design thinking approach. Students from the NTU Mechanical Engineering programme are exposed to design methods through courses such as Engineering Innovation and Design. In other institutions, design thinking is introduced in the form of optional modules or projects. At the SIT, students can take credit-bearing modules and workshops to learn about design thinking through project-based learning and UX design case studies and methodologies.¹⁶ At the LASALLE and NAFA, non-design students are given opportunities to read design as an elective.
- 2.5. While exposure to the design discipline is important, design-led creative thinking is best learnt in a transdisciplinary environment where people from different disciplines and backgrounds work together to understand needs, ideate, experiment, and solve real-world problems. In these settings, students can also acquire and hone communication and strategic thinking skills, both of which are in-demand skillsets sought by the industry.

12 This Design Thinking module is called “Innovation Toolkit” in NYP, “Creative Concepts” in RP and “Innova” in TP.

13 The description of the “Social Innovation Project” can be found in Chapter 2.

14 In addition, SMU has already embedded Design Thinking into a compulsory ideation module of its Masters of Science in Innovation programme, and in other creative thinking and entrepreneurship courses.

15 The design segment of this compulsory module is developed and taught by the NUS Division of Industrial Design.

16 In the SIT, the non-design degree programmes have built in design thinking into the curriculum for the purpose of project work and to provide students with an additional tool to facilitate their thinking process. In 2014, the first batch of Accountancy students in SIT attended design thinking workshops as part of their Integrated Work Study Programme so as to enable innovations in the workplace.

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- 2.6. Currently, some of our IHLs offer transdisciplinary platforms that enable students from different schools to come together to learn and apply design-led creative thinking. An example is the Design Odyssey programme in SUTD which was jointly established by the Massachusetts Institute of Technology International Design Centre in partnership with the JP Morgan Foundation. The programme allows students from different disciplines to come together to solve social and industry challenges using design methods and design innovation processes, as well as to learn from mentors from the industry. At SMU, the SMU-X curriculum combines academic with experiential learning, and offers design thinking courses to non-design students from different schools. In such courses, students collaborate and use design-led approaches to tackle real-world issues brought in from the industry.
- 2.7. More can be done to create sustainable opportunities for transdisciplinary collaboration among different schools within the IHLs. This will help more students learn about how design can be applied across different sectors of society.

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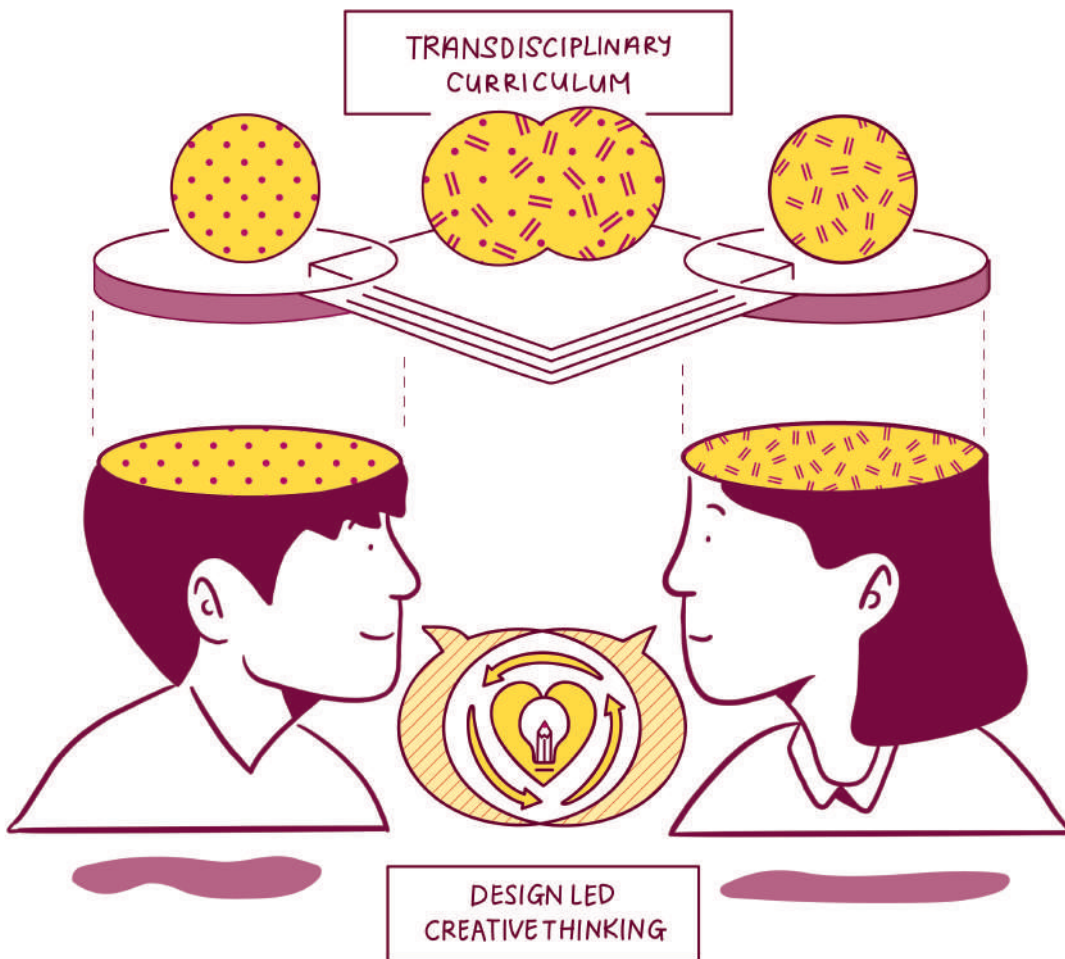
Impart design-led creative thinking skills to students across more disciplines

a. Promoting transdisciplinary platforms within the curriculum that enable the cultivation of design-led creative thinking

- 2.8. To widen the scope of design learning, the DERC recommends that IHLs consider establishing more platforms for students from different disciplines to come together to learn, practise and apply design-led creative thinking on real-world problems. Such platforms could be incorporated within the formal curriculum.
- 2.9. Besides acquiring skills in design-led creative approaches and design thinking, such platforms help students to develop essential skills such as empathy, communication and problem-solving skills. The transdisciplinary setting also enables the cross-pollination of ideas and enriches students' learning experience as they gain a deeper understanding of the broad approaches across disciplines in the problem-solving process. This will better prepare students for an innovation-driven economy where transdisciplinary collaboration and design-led creative thinking skills are needed to solve complex challenges.

“Let’s Design Together” Pilot Programme

- 2.10. To test out this recommendation, SP will be the first polytechnic to prototype a transdisciplinary design-learning programme in their curriculum. In the academic year 2019, SP will run the “Let’s Design Together” programme as a semester-long, credit-bearing module. Called the “Transdisciplinary Innovation Project”, it brings together students from different schools in SP to solve challenges given by industry partners. A common timeslot will be set aside for students to participate in this programme.
- 2.11. The first stage of planning involves getting industry partners to provide briefs for the students. These partners will also offer industry perspectives, technical expertise, and mentorship throughout the course of the project. Students will first learn the theoretical principles of design-led creative thinking before applying them on the brief. In this



Promoting transdisciplinary platforms within the curriculum that enable the cultivation of design-led creative thinking

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process, they will conduct field work, research, define problem statements, ideate, prototype and present their ideas. Students are trained to employ design-led creative thinking to come up with an engineering or business solution. This nurtures a creative and growth mindset in students and helps them make a difference to their community. It also sharpens their design sensibilities and help them gain a better appreciation of how design can impact upon their daily lives.

- 2.12. The value of this programme in effectively imparting students with design-led creative thinking skills and other non-design skills can be assessed by gathering feedback from students, facilitators, industry partners, and mentors. The findings will be shared with other IHLs should they wish to create a similar programme.
- 2.13. The DERC envisions this recommendation to provide a foundation for nurturing a workforce with design-led creative thinking competencies across different levels of disciplines. It will deepen the skills of the Design Specialist, and provide platforms to nurture Design Integrators and Design Multipliers. Such a collective upskilling of a nation will drive industry transformation, and ensure that Singapore can thrive in the future economy.

Summary

The DERC's second recommendation is to impart design-led creative thinking skills for students across more disciplines.

This can be done by:

- a. Promoting more transdisciplinary platforms within the curriculum to enable the cultivation of design-led creative thinking.

SP will pilot this recommendation via its "Let's Design Together" programme.

RECOMMENDATION 3

Support Continuing Education and Training for design professionals and educators

3. The changing role of design professionals and educators

- 3.1. Organisational processes and services are being redesigned in the midst of economic and industry transformation. This presents opportunities for design professionals to not only fuel innovation in the design sectors, but to enter non-design sectors as well. In the next five years, more design professionals are expected to be versatile enough to assume the role of Design Integrators and operate beyond traditional design disciplines. Equipped with non-design skills on top of their technical skills, they will seize opportunities in areas of emerging employment demand. This can be found at the intersections of design, business and technology, in domains such as Business Design, Service or Experience Design, Strategic Design and Design Research.¹⁷
- 3.2. Like design professionals, design educators, who encompass the teaching staff in the IHLs and CET training institutions, need to continually upgrade their skillsets in order to nurture a design workforce that meets the needs of the future economy. Besides periodically refining and sharpening their technical skills and knowledge of industry, design educators also need to teach non-design skills to prepare students for a more complex employment landscape. Time and resources need to be set aside for design educators to sharpen their craft and broaden their skillsets.

¹⁷ These non-design skills gap were identified from the NDIMS 2017.

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- 3.3. There is already a variety of professional development initiatives for design educators in the IHLs today. Noteworthy efforts include the SP annual Design Thinking Summit which brings together practitioners and educators from different IHLs to discuss issues and trends in design thinking and user experience design. Most IHLs also require design educators to undergo industry attachments with high-profile design firms, or in design or innovation units within a company. This helps them better understand the expectations of design graduates. At the RP, design educators are enlisted as consultants through the School of Technology for the Arts' Experience Design and Gamification Centre to provide solutions to industry partners. Through these engagements, they glean insights into the needs of clients that can in turn make their teaching more relevant. The Learning Sciences Lab at the SUTD provides opportunities for staff to share and learn best practices from industry players and other IHLs through



The changing role of design professionals and educators

talks, seminars, and conferences. At the SIT, educators embark on overseas study trips to universities and companies in Scotland, Japan and Hong Kong to gain a better understanding of different design curricula and industry practices in order to continually refine their curriculum.

RECOMMENDATION 3

Support Continuing Education and Training in design professionals and educators

a. Deepen strategic, management, analytical and communication skills through enhanced CET programmes and incentives for design professionals to take on the role of a Design Integrator

- 3.4. The DERC recommends that CET programmes and incentives be enhanced to support the deepening of strategic, management, analytical and communication skills for design professionals. Currently, individuals can tap into a range of CET programmes and incentives such as the DesignSingapore Scholarship and SkillsFuture Study Awards, as well as the Workforce Singapore's Professional Conversion Programmes (PCP) which is targeted at Professionals, Managers, Executives and Technicians (PMET), including mid-career switchers, to undergo skills conversion and move into new occupations and progress vertically within the design field, or laterally into other industries.
- 3.5. More DesignSingapore Scholarships and SkillsFuture Study Awards for the design sector can be provided to individuals who have an interest in acquiring non-design skills that are needed for them to become Design Integrators. CET training providers can take reference from the SFwD to develop CET programmes that are aimed at bridging skills gaps and meeting the needs of the design and non-design sectors.

b. Support design educators to maintain industry relevance through a skills competency matrix

- 3.6. Having frequent touchpoints with industry will enable educators to be better prepared to lead students on real-world design briefs as part of their learning within the formal curriculum. The IHLs support the development of their workforce in this area through different ways – in some, a more structured approach is taken, while in others, it is left largely to the educators themselves to initiate such training. The development of a common skills framework for design educators will further support efforts to upskill and reskill all design educators to ensure that no one is left out in the continuing education journey.
- 3.7. The DERC recommends that a skills competency matrix be developed to guide the professional development of design educators. This matrix could be part of an updated SFwD, adding a new track focusing on Education, expanding on the existing four tracks of Design, Business, Innovation and Technology. The proposed DEAC will be well-placed

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to provide advice on the development of this matrix, and to conduct reviews at strategic junctures to ensure that the skills outlined remain relevant to industry needs.

- 3.8. The skills competency matrix will not only provide clarity on the skills design educators need to perform their roles effectively, it will also guide design professionals who are interested in teaching, on the additional skills they need. This facilitates the transition of design professionals into the education sector, either as full-time staff or as adjunct or part-time lecturers where they work in both industry and education concurrently. Opening more routes for design professionals to work in the education sector enables the IHLs to enjoy additional access to industry. This ensures that the design pedagogy is closely aligned with industry trends and developments, and that robust professional learning communities are developed within each IHL.
- 3.9. Lastly, to better support design educators to deepen their technical expertise and knowledge of the latest pedagogies in design, the DERC recommends they be included



Support design educators to maintain industry relevance through a skills competency matrix

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in the SkillsFuture Study Awards for the design sector. This opens up a talent pipeline of master teachers and thought leaders in design education who possess deep specialist skills and broad industry experiences, raising the quality of design higher education in Singapore.

Summary

The DERC's third recommendation is to support CET for design educators and professionals.

This can be achieved through:

- a. Deepening strategic, management, analytical and communication skills through enhanced CET programmes and incentives for design professionals to take on the role of a Design Integrator; and
- b. Supporting design educators to maintain industry relevance through a skills competency matrix.

RECOMMENDATION 4

Create real-world design learning platforms for professionals

4. Bringing design education to working professionals

- 4.1. In order to constantly innovate and create new value in the future economy, working professionals need to constantly upgrade themselves and acquire new skills. Design-led creative thinking is one of the key skills that can help them adapt to changes in the social and economic landscape.
- 4.2. As explained in Recommendation 2, design-led creative thinking is best learnt and practised in an immersive environment while working on real-world projects. While these learning environments are offered through existing CET programmes for the public, they tend to take the form of ad-hoc competitions, hackathons or one-off workshops. These are not sustained learning platforms and are limited in building up the interest required for the mastery of design-led creative thinking.
- 4.3. Given that it takes time and frequent practice to pick up this skill, more opportunities can be created for professionals to learn and practise design-led creative thinking beyond formalised learning settings in the CET space. Sustainable design learning platforms with low barriers to entry will allow more professionals, regardless of their disciplinary and academic backgrounds, to learn and experiment with design over a long period of time. v

RECOMMENDATION 4

Create real-world design learning platforms for professionals

a. Enable real-world learning beyond the formal curriculum

- 4.4. The DERC recommends creating more platforms where professionals can come together to deepen their learning of design-led creative thinking, and to hone this skill by devising possible solutions to real-world social and economic challenges. This can be supported by the creation of experiential learning spaces—physical or virtual—that are facilitated by design specialists and experts in design-led creative thinking. Various agencies and organisations can fund and support these learning platforms.



Enable real-world learning beyond the formal curriculum

“School of X” Pilot Programme

- 4.5. To pilot this recommendation, the DERC proposes starting the “School of X” programme. This real-world open learning platform offers opportunities for working professionals to learn and practise design-led creative thinking, and to co-create solutions for the community. It brings together professionals in both the private and public sectors to tackle complex social and economic issues that can benefit from a design-led creative thinking approach. Through experiencing how design-led creative thinking can address real-world issues, participants will begin to understand design as a framework and mindset for creative problem-solving beyond its aesthetic function. Participants will not be formally assessed on how they approach the challenges, but will receive feedback from collaborators and facilitators. This will be an opportunity for participants to build up a portfolio of their work.
- 4.6. The School of X will partner with interested stakeholders to curate design challenges, and connect challenge sponsors to a selected pool of facilitators and participants. A curator will oversee the design challenges from a content and engagement level. The curator will also be in charge of working with various stakeholders for the project and forming transdisciplinary teams with the participants. The three main groups of stakeholders involved are:
- i. **Challenge sponsors**
They identify and own the briefs to be worked on, provide background knowledge and subject matter expertise, and support the subsequent implementation of outcomes. They will also play an active role in guiding and mentoring participants.
 - ii. **Design facilitators**
These are typically design practitioners or experts in design-led creative thinking. They will guide participants to address the briefs through design-led creative thinking approaches.
 - iii. **Participants**
These are professionals who are interested in learning about design-led creative thinking approaches, or who have varying degrees of knowledge in the area pertaining to the design challenge. They would be from different professional backgrounds, and can contribute to the team’s learning by sharing their unique skillsets with one another.
- 4.7. An example of a challenge sponsor is a hospital that provides a challenge statement about facilitating an individual’s transition from healthcare institutions back into the community. The design facilitators for this challenge could be design educators from an IHL, or professionals from design consultancies. Participants will work with stakeholders to generate ideas which could then be further developed and refined. Upon completing the project, participants would have created prototypes of solutions which could be implemented and even scaled. Through this process, they will acquire

RECOMMENDATION 4

design sensibilities and learn to apply design-led creative thinking to improve their work and everyday lives. Other examples of challenge sponsors could be a neighbourhood interest group which is seeking to improve interactions between generations or a hawker centre keen to promote healthy eating.

- 4.8. The Dsg will develop the framework for the School of X, which the DERC hopes other organisations will adopt to offer their own real-world design learning platforms, thus ensuring its sustainability and growth.
- 4.9. The DERC believes that this recommendation will benefit the participants involved in the design challenges and give all stakeholders involved the opportunity to hone their skills in organisation, teaching, facilitation and management in a transdisciplinary environment. By getting individuals from different industries and backgrounds to collaborate, learn and master design-led creative thinking together, they will also develop empathy, compassion, as well as a spirit of innovation and resilience that will make Singapore a more liveable and loveable city.

Summary

The DERC's fourth recommendation is to create real-world design learning platforms for professionals.

We recommend:

- a. Enabling real-world design learning beyond the formal curriculum.

A pilot programme called the "School of X" will offer a real-world learning platform for working professionals to learn and practise design-led creative thinking, and to co-create solutions for the community.

RECOMMENDATION 5

Empower everyone to learn about design through modular courses and learning communities

5. Creating opportunities for developing design as a national skillset

- 5.1. Besides developing design professionals, it is essential for the general public to learn about design. In line with the Design 2025 vision of developing design as a national skillset, more opportunities could be created for everyone to learn and apply design-led creative thinking.
- 5.2. There are currently some 60 design-related short modular courses in the SkillsFuture Series, ranging from design innovation and design thinking, to applied digital design. These are anchored primarily by the IHLs. Dsg can work with the IHLs and SSG to include a wider range of design-related courses, from preparing professional designers for work, introductory to advanced courses under the SkillsFuture Series and also placement programmes to encourage new and mid-career professionals to join the design sector.
- 5.3. It is important to go beyond this sphere of theoretical knowledge and develop more courses that offer opportunities to learn how design can be applied to emerging design domains, and in everyday life. Such courses should have low barriers to entry so that more people, including those without design backgrounds, can learn about design and develop design sensibilities.

RECOMMENDATION 5**Empower everyone to learn about design through modular courses and learning communities****a. Create more modular courses in emerging design domains**

- 5.4. The DERC recommends creating more modular courses in emerging design domains, such as Service Design, Experience Design, Strategic Design and Business Design, that are targeted at individuals at all stages of learning—from beginner to intermediate to advanced levels. The SkillsFuture Series could provide a possible mode for these courses to be implemented. A variety of modular courses in design gives individuals the flexibility to make decisions based on their needs and interests.



Create more modular courses in emerging design domains

RECOMMENDATION 5

- 5.5. Service Design, Experience Design, Strategic Design and Business Design have been highlighted in this recommendation because they are applied rather than aesthetic in nature. Hence, they offer individuals without any background in design, concrete means to translate what they have learnt into their work and everyday lives. For example, understanding Service Design will help enhance services and value chain management, ultimately giving rise to a more positive user experience. This knowledge can be applied to environments ranging from the home, schools, Voluntary Welfare Organisations¹⁸, and even to workplaces such as retail stores and multinational companies.
- 5.6. Such modular courses impart critical skills in design concepts and design literacy to participants, and also give them the opportunity to use what they have learnt by focusing on its application. Expanding the current range of CET courses would eventually raise future generations of Design Multipliers who will be able to champion design-led creative thinking and harness it to create new value in their workplaces and in their everyday lives.

b. Promote lifelong learning in design through learning communities

- 5.7. Design learning is a lifelong process that takes time to acquire knowledge and subject matter expertise. The DERC recommends ramping up efforts to promote lifelong learning in design skillsets through creating ground-up learning communities across Singapore. They will allow people to exchange ideas and inspire one another to learn about design.
- 5.8. Such communities are already established in cities around the world. In Japan, the Shibuya University Network connects people living or working in the neighbourhood to learn and share knowledge with one another. The network secures different locations within the neighbourhood of Shibuya— such as cafés, parks or retail stores—for conducting free lessons. Individuals who want to teach or learn can register their interest through a website that is managed by volunteers. The goal is to integrate the “university network” into the city to create an open space for learning, co-creation and social development.
- 5.9. There are also other technology-driven platforms for learning, such as Quora and Stack Exchange, where individuals can ask questions and crowdsource for answers. Growing these ground-up learning communities helps promote lifelong learning in design.
- 5.10. The DERC also recommends leveraging existing national movements such as the SkillsFuture Festival, to organise learning platforms, interactive workshops, and showcase human-centred and culturally-relevant solutions to real-world problems that are developed by Singaporeans. This will ignite public interest in wielding design as a novel and effective tool for problem-solving and innovation.

¹⁸ A Voluntary Welfare Organisation is a non-profit organisation that provides welfare services and/or services that benefit the community at large.

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- 5.11. By developing a lifelong learning culture, different groups of people—from the general public to Design Specialists—can learn about design and how its applied in real-world contexts. Although time will be needed to change mindsets, these courses and platforms are important first steps towards making design a more pervasive feature of our society and economy.

Summary

The DERC's fifth recommendation is to empower everyone to learn about design through modular courses and learning communities. This is in line with the Design 2025 vision of developing design as a national skillset.

This can be achieved through:

- a. Creating more modular courses in emerging design domains; and
- b. Promoting lifelong learning in design through learning communities.

CONCLUSION

Advancing design education in Singapore together

- i. This report illustrates how a robust design education system can help everyone, whether designers or non-designers, appreciate the value of design and apply it to their professional work and everyday lives. By 2025, Singapore's design education system will offer innovative ways for all to learn design, and these will be facilitated by design educators who are current with industry developments and capable of teaching effectively. Such a system will ensure design becomes part of a national skillset for generations to come. As more Singaporeans appreciate the importance of design, our nation will be brought to the cutting-edge of innovation and grow to be a leading hub for design education in Asia.
- ii. To realise these strategies, key stakeholders, including the IHLs, public service agencies, and industry, must come together. The Dsg is currently facilitating this through the development of the Design Industry Manpower Plan. It aims to embed design as a national skillset through strategies to enable talent development, and to address the different phases of design education across the General Education, PET and CET spaces. Industries also serve as important partners in education as they provide the real-world contexts and resources to help both students and educators develop and deepen their capabilities. Finally, citizens can take ownership of their personal development by embracing the spirit of lifelong learning. Only then might they nurture empathy, resilience, adaptability and creativity — the qualities that are essential for them to contribute to Singapore becoming a liveable and loveable city in the future economy.

Appendix

List of Institutes of Higher Learning

Institute of Technical Education	ITE
Polytechnics	
Nanyang Polytechnic	NYP
Ngee Ann Polytechnic	NP
Republic Polytechnic	RP
Singapore Polytechnic	SP
Temasek Polytechnic	TP
Autonomous Universities	
Nanyang Technological University	NTU
National University of Singapore	NUS
Singapore Institute of Technology	SIT
Singapore Management University	SMU
Singapore University of Social Sciences	SUSS
Singapore University of Technology and Design	SUTD
Arts Institutions	
LASALLE College of the Arts	LASALLE
Nanyang Academy of Fine Arts	NAFA

List of design courses offered by the Institutes of Higher Learning

Design Courses offered by Polytechnics and the Institute of Technical Education

(Compiled as of March 2020)

No	Institution	PET Programmes	CET Programmes
1.	NP	Diploma in Design (Starting in 2020) Diploma in Product Design & Innovation (Last intake in 2019) Diploma in Sustainable Urban Design & Engineering (Architecture) (Last intake in 2019) Diploma in Landscape Design & Horticulture	-
2.	NYP	Diploma in Industrial Design Diploma in Spatial Design Diploma in Visual Communication Diploma in Architecture Diploma in Interaction Design	WSP Specialist Diploma in Design & Make WSP Specialist Diploma in Visual Communication WSP Specialist Diploma in Spatial Design Specialist Diploma in Design Strategy & Management Specialist Diploma in Service Experience Design & Innovation
3.	RP	Diploma in Design for User Experience Diploma in Media Production & Design Diploma in Game Design	Specialist Diploma in Digital Content Creation for Business Specialist Diploma in User Experience for IT
4.	SP	Diploma in Interior Design Diploma in Experience & Communication Design Diploma in Architecture Diploma in Landscape Architecture	Diploma in Design (Visual Communication) Specialist Diploma in User Experience & Digital Product Design
5.	TP	Diploma in Apparel Design & Merchandising Diploma in Communication Design Diploma in Environment Design – Retiring Diploma in Interior Architecture & Design Diploma in Product & Industrial Design Diploma in Retail & Hospitality Design – Retiring (Last intake – 2019)	WSP Specialist Diploma in Branding Design WSP Specialist Diploma in Integrated Digital Communication WSP Specialist Diploma in Lighting Design
6.	ITE	Nitec in Visual Communication Nitec in Digital Animation Nitec in Fashion Apparel Production & Design Nitec in Architecture Technology Nitec in Product Design Nitec in Interior & Exhibition Design Higher Nitec in Architectural Technology Higher Nitec in Performance Productions Higher Nitec in Visual Merchandising Higher Nitec in Interactive Design	Nitec in Visual Communication Nitec in Digital Animation Nitec in Fashion Apparel Production & Design Nitec in Architecture Technology Nitec in Product Design Nitec in Interior & Exhibition Design Higher Nitec in Architectural Technology Higher Nitec in Performance Productions Higher Nitec in Visual Merchandising Higher Nitec in Interactive Design

Design Courses offered by Autonomous Universities

No	Institution	PET Programmes	CET Programmes
1.	NTU	Bachelor of Fine Art in Arts, Design and Media	Masters of Arts (Research) in Art, Design and Media PhD Programme
2.	NUS	Bachelor of Arts in Architecture Bachelor of Arts in Industrial Design Bachelor of Landscape Architecture (starting in 2020)	Master of Science (Coursework) in Integrated Sustainable Design Master of Architecture (Coursework) Master of Landscape Architecture (Coursework) Master of Arts (Coursework) in Urban Design Master of Arts (Research) in Architecture Master of Arts (Research) in Industrial Design Doctor of Philosophy (Research) in Architecture Doctor of Philosophy (Research) in Industry Design
3.	SIT	Bachelor of Arts (Honours) in Communication Design (in collaboration with the Glasgow School of Art) (Last intake in 2019) Bachelor of Arts (Honours) in Interior Design (in collaboration with the Glasgow School of Art) (Last intake in 2019)	-
4.	SMU*	-	-
5.	SUSS*	-	-
6.	SUTD	Bachelor of Science in Architecture and Sustainable Design Bachelor of Science in Product Development Bachelor of Science in Engineering Systems and Design Bachelor of Science in Information Systems Technology and Design Bachelor of Science in Design and Artificial Intelligence (starting in 2020)	Master of Architecture Master of Innovation by Design Master of Science in Security by Design Dual Masters in Nano-Electronics and Design PhD Programme

* While SMU and SUSS do not offer degrees in design, they provide their students with modules and programmes to acquire design and design-led creative thinking skills.

APPENDIX

Design Courses offered by Art Institutions

No	Institution	PET Programmes	CET Programmes
1.	LASALLE	Diploma in Design Communication and Experiences Diploma in Creative Direction for Fashion Diploma in Interior Design Bachelor of Arts (Honours) in Design Communication Bachelor of Arts (Honours) in Fashion Design and Textiles Bachelor of Arts (Honours) in Fashion Media and Industries Bachelor of Arts (Honours) in Interior Design Bachelor of Arts (Honours) in Product Design	Masters of Arts in Design
2.	NAFA	Diploma in Advertising Diploma in Graphic Communication Diploma in Illustration Design with Animation Diploma in Fashion Design Diploma in Fashion Merchandising and Marketing Diploma in Design (Furniture and Spatial) Diploma in Design (Interior and Exhibition) Diploma in Design (Landscape and Architecture) Diploma in Design (Object and Jewellery) Diploma in Screen Media Bachelor of Arts (Honours) in Spatial Design Bachelor of Arts (Honours) in Fashion Bachelor of Arts (Honours) in 3D Design Practice Bachelor of Arts (Honours) in Design and Media Bachelor of Arts (Honours) in Fashion and Marketing	

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