

**Project Title:** Fashioning STEM for good: Inclusive fashion design and smart textiles for social good.

## **Project Particulars**

**Project Period:** June 2022–October 2023 (16 months)

### **Project Details**

#### **Needs Assessment and Applicant's Capability**

Nurturing talent in innovation and technology (I&T) is key to the sustainable development of a vibrant economy. Science, Technology, Engineering and Mathematics (STEM) education is vital for nurturing a globally competitive workforce. As noted in the 2021 Chief Executive Policy Address (2021), Hong Kong's I & T industry is flourishing with an ever-growing eco-system which will contribute to cutting-edge industries' long-term development. This is evidenced by the substantial increase in local demand for researchers in such fields (2021–22 Budget Speech, 2021). Fostering STEM literacy at the early stages of education will equip Hong Kong students with the core knowledge and interdisciplinary skills needed to solve real-world problems and contribute to the future talent pool of the economy.

HK LEGCO (2020) identified the following major hurdles in local STEM education: vague teaching guidelines with insufficient pedagogical experience and support. Formal education and teacher training in Hong Kong are often discipline-focused and tend to favour linear teaching and learning strategies that do not fully explore the knowledge opportunities present in interdisciplinary STEM content. This skewed emphasis often results in technical content that young students may find difficult to contextualise in daily life.

This proposed project will address the issues highlighted by LEGCO. Involving international cross-sector collaborations, the project will consist of an interdisciplinary teaching and learning programme for local secondary schools that integrates STEM themes and creative thinking via inclusive fashion design with smart textiles. To nurture innovation for social good via the use of textile-based technology to create wearable fashion for elderly users with limited mobility and flexibility to assist them with their wellbeing and physical challenges. Inclusive fashion involves the design of wearables that are accessible, attractive, and pertinent to the needs of users.

As a field of study, design is by nature, reflective and adaptive; it thus has the potential to effectively bridge creative problem solving and innovative STEM knowledge. This project will aim to actualise this by bringing together collective expertise and support from different sectors: the local welfare council, world-leading academics, fashion industry with innovation and design communities. The specific proposed collaborators for the project will be as follows: the Hong Kong Sheng Kung Hui Welfare Council (HKSKHWC); Open Style Lab (OSL), US; international fashion brand Theory; the Hong Kong Fashion Designers Association (HKFDA); the Royal College of Art (RCA), UK and Hong Kong Science and Technology Parks Corporation (HKSTP). This practice-based programme will include comprehensive guidelines for a pedagogical approach, content, materials and activities. A central component of the project will be design studio sessions during which the participants will design and develop innovative solutions using real-world case studies based on actual elderly users from HKSKHWC. The council's staff and their elderly users will interact and speak directly with the participants about their needs in terms of clothing, mobility and well-being, allowing the participants to gain first-hand understanding of these issues.

The fashion and clothing industry is generally perceived by many to be ephemeral and glamorous, relevant only to mainstream audiences and consumers. However, research has shown that clothing facilitates the full participation in society of older people with disabilities, thereby playing an important role in promoting and protecting their rights (Tan & Jun, 2018). Failure to meet their clothing needs prevents people with disabilities from actively participating in important life experiences and has a negative impact on their overall well-being (Kabel, Dimka & McBee-Black, 2017).

The World Health Organization projects that by 2050, the global population of people above the age of 65 will be more than double that of the population of people under the age of 5 (World Health Organization, 2018). In Hong Kong, the elderly population is expected to reach 30% of the local population before 2036, up from 16.5% in mid-2017 (HKSAR Government, 2016). More than 46% of older people (those aged 60 and over) have a disability, and more than 250 million older people experience moderate to severe disabilities (United Nations, 2021). Interactive wearable technology offers customizable functions with the tactile familiarity of everyday textiles, providing design opportunities to adapt to the evolving needs of older people.

In light of this, one way to ensure that STEM curricula continue to be responsive to real-world challenges is by engaging teachers and students in design thinking, connecting them with global issues surrounding aging and incorporating learning about innovative technologies. This can be done through the study of inclusive fashion design and more specifically, the design of universally accessible wearables. Teaching students to consider users with all needs and abilities will nurture

empathy skills, which are aligned with the region's goal of building a caring community with empathy for the underprivileged. (Chief Executive Policy Address, 2021).

The proposed project will be delivered using a hybrid teaching and learning mode, combining face-to-face practice-based design studio sessions, online expert tutorials, critiques and school-based exhibitions. It will encourage active learning via practice, effectively using the act of making to discuss, experiment and apply interdisciplinary knowledge and skills. The project will be distinguished by its integration of design thinking and technology, and the combined application of core scientific knowledge and creativity to foster problem-solving skills, thereby helping students to become innovative global citizens of the future.

### **Applicant's Capability**

#### Background and affiliations:

Dr Jeanne Tan holds dual roles at The Hong Kong Polytechnic University (PolyU). She is an Associate Professor at the Institute of Textiles & Clothing (ITC) and the Chief Operating Officer of the Laboratory for Artificial Intelligence in Design (AiDLab) based at the Hong Kong Science and Technology Park (HKSTP). The lab is a strategic partnership between PolyU and the Royal College of Art (RCA), UK. It is the region's leading research platform that synergises intelligence technology and design. PolyU is Hong Kong's tertiary education leader for fashion and has led cutting-edge interdisciplinary research and teaching that successfully uses design principles and advanced technology to create practical innovations that have social impact. Tan's affiliations combine the expertise, resources and networks of world-calibre fashion practitioners, technologists and academics with a deep local knowledge of the region's education system.

#### Teaching and research experience for fashion and inclusive design.

Tan has over 16 years of experience teaching fashion and textile design at undergraduate and research levels; she has in-depth experience in programme management, design and co-ordination. Tan's research focuses on the design of smart textiles for fashion (Fig. 1) and well-being (Fig. 2). Her practice-based research is at the interface of design and technology and continuously evolves, drawing inspiration from emerging innovations to inform her teaching.

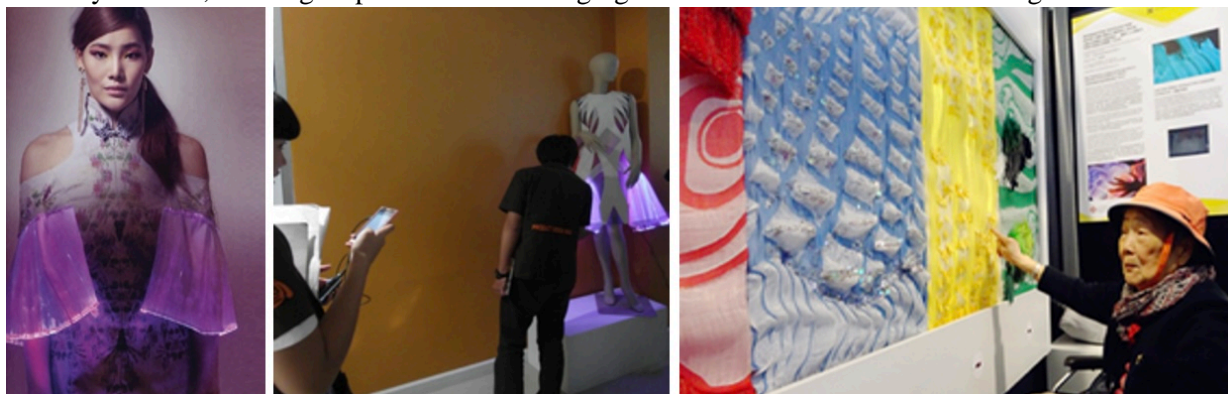


Fig. 1: Interactive cheongsam developed in collaboration with Hong Kong Heritage Museum.

Fig. 2: Interactive sensory wall panel for people with dementia, developed in collaboration with HKSKHWC.

Tan has successfully integrated her fashion teaching and technological research into the context of inclusive design. Her work related to inclusive fashion design has received awards and international media attention. Notable examples in chronological order are as follows:

1. *2020/2021*: Received the Caring Ambassador Award of the Caring Company Scheme from the Hong Kong Council of Social Services for her collaborative research work with HKSKHWC for which she designed sensory interactive materials for people with dementia.
2. *2019*: Invited to give a TedX speech about inclusive design and wearable technology for the elderly.
3. *2018*: Featured on the American Public Broadcasting Service (PBS) Newshour Weekend (2018) for her work on designing accessible fashion for older people with mobility issues, a research project conducted in collaboration with the Parsons School of Design, The New School and the Riverside Premier Rehabilitation and Healing Center in New York (Fig. 3)
4. *2013*: Awarded the Hang Seng Bank Best Sustainable Service Project for a service-learning project that used fashion design as a rehabilitation medium for participants from the Society of Rehabilitation and Crime Prevention.



Fig. 3: Co-designing smart wearables with elderly users in New York, US. Fig. 4: A D-STEM workshop at Parsons, US.

Tan has established a research reputation for her interdisciplinary approaches to designing smart wearables for fashion and inclusive users. She has been invited as design residents and lead workshops at the Royal College of Art in the UK, the Parsons School of Design in the US (Fig. 4) and Hongik University in South Korea. Her creative research has been exhibited at venues such as the Victoria and Albert Museum in London, UK (Fig. 5) and the Arnold and Sheila Aronson Gallery in New York, US (Fig. 6); her smart fashion design ‘Neo-neon’ is also included in the China National Silk Museum’s permanent collection (Fig. 7).



Fig. 5: Exhibition at the Victoria and Albert Museum, London, UK. Fig. 6: Exhibition at the Arnold and Sheila Aronson Gallery, New York, US. Fig. 7: ‘Neo-neon’ collected as part of the China National Silk Museum’s permanent collection.

#### Experience with large-scale collaborative projects

Tan has experience in conducting large-scale projects that focus on design thinking with technology and involve international interdisciplinary collaborators. Her recent funding grants include HK\$4.2 million from InnoHK Research Clusters (AiDLab RP3-5), HK\$1.29 million from the CreateSmart Initiative (CSI (D)/1808/0259), HK\$1.49 million from Quality Education Fund (EDB/QEF/ 2019/0531) and is a member of the new PolyU Photonics Research Institute (PRI) which received over HKD\$20 million in funding. The InnoHK project explores the integration of intelligent systems with textiles for interiors and fashion. The CSI project promoted Hong Kong as a creative capital for design-led technology innovations for social good and the event was attended by over 400,000 attendees. The QEF focuses on AI and product design and surpassed forecasted student beneficiaries by over 35%. PRI is an institute that focuses in advancing the knowledge and applications of photonics.

#### Fashion industry experience

Tan actively engages with the fashion industry through design and training consultancies. Her clients include the LVMH Group (managing brands such as Celine, Marc Jacobs, Kenzo, Givenchy and Loewe), which have retained her services for their Asia-Pacific and regional markets. Other notable clients include Nike, Alibaba, Kiabi, Fashionary, the Hong Kong SAR government (EMSD) and China Light and Power Company (CLP). Tan has a proven track record in academia, community engagement and the fashion industry, which showcases her ability to undertake the proposed project.

#### Project Co-Organiser: Hong Kong Science and Technology Parks Corporation (HKSTP)

HKSTP is Hong Kong’s largest research and development base with a vision to create a vibrant innovation and technology ecosystem to deliver social and economic benefits to Hong Kong and the region. As a co-organiser of the project, HKSTP will provide the use of its Inno2 rooms and its Experience Centre as the venues for the introduction sessions of the programme. The Experience Centre is an immersive space that showcases Hong Kong’s successful examples of creative STEM innovations. It will help bring the project content to life by enabling the participants to engage, witness and truly understand the value of innovation, which can be applied to their wider learning context and everyday life. HKSTP experts will further support the project as guest speakers who will introduce creative innovations in Hong Kong and as mentors

who will review the completed projects. The value of the venues is estimated at HKD\$76,000. Contact Person: Dr Carrie Ling, Assistant Director, Business Development (InnoHK), carrie.Ling@hksto.org Tel: 26290102



Fig.10: HKSTP Experience Centre



Fig.11: INNO2 multi-function rooms at HKSTP

### **Project Collaborators**

This cross-sector project will include collaborators from the fashion industry, the professional community, NGOs, world-leading academia and fashion design communities. The collaborators are the Hong Kong Sheng Kung Hui Welfare Council (HKSKHWC), Open Style Lab (OSL, US), Theory and the Hong Kong Fashion Designers Association (HKFDA). Representing different sectors of society, the collaborators will provide multifaceted insights, which will be valuable for the delivery of interdisciplinary content.

#### **Social Welfare Organisation Collaborator: Hong Kong Sheng Kung Hui Welfare Council (HKSKHWC)**

HKSKHWC is a leading social welfare organisation in Hong Kong, which offers diverse services to users of all age groups and different strata in society. The council will co-develop case studies for inclusive design and will coordinate the participation of case study users who will discuss their experiences and needs with the participants during the design studio sessions. Their input will form realistic scenarios and pose real-world challenges for the project participants to respond to by applying inclusive design skills and technological innovations. The council representatives will contribute to the project by being members of the sharing sessions and critiques and giving mentoring advice to the project stakeholders. [REDACTED]

#### **International Non-Profit Organisation Collaborator: Open Style Lab (OSL)**

OSL is a non-profit organisation based in New York, US. It is committed to making style accessible to everyone, regardless of their cognitive and physical abilities. The lab works with top American universities such as the Massachusetts Institute of Technology (ranked first overall in the QS World Rankings) and the Parsons School of Design at The New School University (ranked third for art and design in the QS World Rankings) to build accessible wearables that address the needs of people with disabilities. Grace Jun, CEO of OSL will contribute to the content planning of the project and will serve as a staff trainer during the workshops. [REDACTED]

#### **Fashion Industry Collaborator: Theory**

Launched in New York in 1997, Theory is an international fashion brand with 436 retail locations. Theory envisions itself as a modern, conscious and responsible company that has a positive impact on customers, the fashion industry and the planet. Theory HK will support the project by sponsoring the materials and clothing that will be used for design experimentation at the design studios. The sponsorship value is HK\$200,000. (Please refer to the attached sponsorship letter.) [REDACTED]

#### **International Academic Collaborator: Royal College of Art, UK (RCA)**

The project's UK academic partner is Anne Toomey, Head of the Textiles Programme at RCA. In 2021, RCA was ranked first in the world for art and design for the seventh consecutive year (QS World University Rankings). RCA has an unrivalled track record of leading cross-disciplinary research to address some of the biggest societal challenges today. Toomey is an expert in textile design and materials, who specialises in design-led innovation and craftsmanship especially with new and emerging materials. She has extensive experience as an industry practitioner and academic. [REDACTED]

#### **Professional Community Collaborators for Design: The Hong Kong Fashion Designers Association (HKFDA)**

Established in 1984, HKFDA represents the leading Hong Kong fashion professionals of the industry. HKFDA representatives will support the project by participating in critiques and offering mentoring advice to the project stakeholders. [REDACTED]

### Local Secondary School Beneficiaries

The target beneficiaries are local secondary school teachers and students. The project proposes to have a total of 32 teachers and 480 students from the 9 schools listed. (Please note that the number of students from each school may vary without affecting the total number of students.)

Secondary School	Contact	Tel	Email
1. S.T.F.A. Lee Shau Kee College	[REDACTED]	[REDACTED]	[REDACTED]
2. S.K.H. Tsang Shiu Tim Secondary School			
3. Caritas Yuen Long Chan Chun Ha Secondary School			
4. P.L.K. Ho Yuk Ching (1984) College			
5. Heep Yunn School			
6. Leung Shek Chee College			
7. St Paul Convent School			
8. S.K.H. Holy Trinity Church Sec School			
9. ELCHK Lutheran Secondary School			

## **2. Goals and Objectives**

### Goals

The main goal of the project is to enhance the STEM learning and teaching experience through design thinking and technology knowledge via the integrated content of inclusive fashion design and smart textiles. The project will enable participants to investigate, explore and innovate wearable tech solutions pertinent to elderly users' needs based on real-world case studies developed with HKS KHWC. The project aims to nurture creativity, critical thinking and empathy to equip the participants to become innovative leaders who create impact for social good.

The project will contribute to teachers' professional training, helping them to develop new ways to actively engage students in STEM with design thinking. The expected outcomes for all participants are the reinforcement of fundamental STEM knowledge, the acquisition of new creative skills and the development of empathy skills.

Vital cross-sector networks will be established between the applicants, participants and project collaborators. The collaborative networks will provide multifaceted perspectives and mentorship opportunities that will help the participants keep abreast of current and emerging issues, thus ensuring that STEM and creative thinking curricula remain relevant and sustainable.

### Objectives

- 1) To develop a comprehensive curriculum integrating STEM and creativity through the study of inclusive fashion design and smart textiles. The curriculum will comprise specific learning outcomes, content, project briefs, studio-based activities and materials.
- 2) To enhance teachers' pedagogy by demonstrating novel ways to engage their students in STEM using creative approaches, with the support of cross-sector collaborators from international and local universities, a welfare council, the fashion industry, and the design and innovation communities.
- 3) To enhance students' STEM knowledge, creativity and empathy skills through projects based on case studies of real-world problems.
- 4) To encourage learning and teaching beyond traditional classroom formats by using a hybrid mode that combines both authentic practice-based learning in the design studio with online tutorials and critiques involving cross-sector collaborators.

### Short-Term Benefits

- Aligned with the changing educational modes due to the COVID-19 pandemic, the project will promote hybrid educational delivery by combining authentic face-to-face design studio sessions with online tutorials and reviews, thus enabling the participants to actively engage with the content and access the best international academics and practitioners.
- The project will provide the participants with multi-perspective insights into a wide range of relevant industries and target audiences who may benefit from creative innovation.

### Long-Term Benefits

- The project will establish cross-sector networks, fostering a collaborative culture and ensuring that STEM education content keeps abreast of the latest innovations.
- The project will nurture empathetic creative innovators who will contribute to the society, industry and policies of tomorrow.
- The project will recommend strategies to professionally support teachers in the areas of inclusive fashion design and technology.

### **3. Targets and Expected Number of Beneficiaries**

- Teachers. Thirty-two teachers involved in STEM, Technology and Living, Design and Technology or Visual Arts will be targeted. (This will be composed of 32 teachers from 8 schools.)
- Students. The target number of students is 480; they will be selected by the teachers based on each school's STEM programme. The content will be designed for participants with no prior knowledge of wearable technology and inclusive fashion, thus allowing the participation of students at all levels.
- Local and international secondary schools, academics and the public. The project content, findings and deliverables will be uploaded to the website. The general public, academics and interested schools will be able to consult the website as a reference or adopt the developed content for their own STEM curriculum.

### **4. Innovation**

The innovations are in line with the key strategies mentioned in the Chief Executive's 2021 and 2020 Policy Addresses, which highlighted the development of the whole person via applied learning, blended learning and the building of a caring community that looks after neglected groups and keeps abreast of evolving global societal needs:

#### Promoting applied learning and enhancing STEM teaching and learning through the study of inclusive fashion design and smart textiles

Fashion and textiles are omnipresent. Because they are relevant to users of all walks of life, they provide an inclusive way to examine how technology is integrated into our everyday lives. The human-centred approach of inclusive fashion practice will enable the participants to engage actively with the content.

#### Nurturing empathy skills to contribute to a caring community

The practice-based design studio sessions will engage the participants by using case studies developed with HKSKHWC, which will be derived from the needs of vulnerable users (people with dementia, mobility restrictions or cognitive issues). The real-world context will enable the participants to connect with people in need and to develop innovations for positive social change.

#### Blended mode for customised learning and teaching experiences

An innovative hybrid approach to learning that combines face-to-face and online delivery will enable the participants to experience authentic design practice while simultaneously having direct access to top international collaborators who would not be available to teach them in a conventional classroom setting. The online access to the project content will be flexible and will enable the schools and the participants to access the materials and collaborators beyond face-to-face sessions. This will help to reinforce and customise their experience according to their pedagogical needs.

#### Cross-sector collaborations to co-nurture future talents for collective impact

The proposed cross-sector collaborators will come from academia, industry and the creative and innovation communities. The applicant and the collaborators will be involved in conducting, facilitating and reviewing the project outputs. The first-hand and current information provided by front-line welfare, fashion and innovation practitioners will provide teachers and students with multifaceted perspectives, giving them deeper insight into the value of and prospects for creative innovation.

#### Learning beyond conventional classrooms to foster collaborative teamwork and adaptive processes that evolve with fast-changing demands for innovation

Design practice involves research, experimental iteration, reflection and ideation refinement. Such an approach will offer the participants a flexible innovation framework, which can be adapted and applied to a wide spectrum of realistic scenarios. This approach involves observation, practice, exploration and problem solving using hands-on skills; it also encourages an independent learning process that continually refines and defines, rather than a conventional linear learning process in which students use standard formulae to achieve precise results.

## 5. Conceptual Framework

The proposed project will be framed by three sets of concepts: universal fashion design principles, empathetic inclusion and interdisciplinary practice. They will form an integral part of the core content of the project and will help to reinforce STEM knowledge, creative and empathy skills to enrich both critical thinking and creative problem solving.

### 1) Universal Fashion Design Principles

Universal design principles are widely used to create products, environments and services that offer better usability for people who have often been neglected by mainstream markets. Teaching on universal fashion design will focus on fashion relevant solutions (Park, Morris, Stannard & Hamilton, 2014) based on the seven key principles of universal design (The Center for Universal Design, 1997). These principles will be used to guide the design process and evaluate the derived outcomes. The principles are as follows:

	<b>Universal Design Principles</b>	<b>Fashion Relevant Solutions</b>
1	Equitable use	Relaxed silhouette
2	Flexibility in use	Versatile way of dressing
3	Simple and intuitive use Perceptible information	Easy donning and doffing
4	Perceptible information	Easy-to-understand dressing procedure, simple design and minimal details
5	Tolerance for error	Optimised for flexibility and size
6	Low physical effort	Easy maintenance
7	Size and space for approach and use	Flexibility and ease of use

### 2) Empathetic Inclusion

Aligned with the aim of fostering a caring community, empathy is a crucial skill that helps to understand unique needs in challenging situations and uses such insights to improve and support people in their struggles. The project will provide opportunities to nurture empathy, which will contribute to the development of communication, leadership, teamwork and intercultural competencies, which in turn will lead to a more inclusive society. The participants will work on projects based on real-world case studies of target users who have specific needs. The descriptions of these case studies will include their background, their needs and the challenges they face in everyday life. The students will actively engage with the project staff and collaborators to investigate the important societal issues highlighted by these case studies and better understand the needs of similarly vulnerable groups.

### 3) Interdisciplinary Practice

Interdisciplinary practice that synergises technology and creative practice contributes to the conception and execution of impactful design. The core knowledge from the project will be transferred through practice and supported through exhibitions, tutorials and critiques. The process of making will encourage critical thinking and reflection through the manipulation of materials and the consideration of realistic scenarios. Conventional assessments are quantitative and often neglect to offer constructive ways for learners to further improve their knowledge and skills; in contrast, interdisciplinary practice facilitates the application of creative technology to realistic scenarios. The studio sessions will be conducted alongside tutorials and reviews that will help the participants identify their strengths and weaknesses through constructive comments that will be conducive to the teaching and learning experience. The exhibitions will help consolidate and disseminate the creative outcomes.

## **Project Content, Outcomes, Activities and Schedule**

The project will be framed by an inclusive approach to the design of wearable technology. The interdisciplinary content can be integrated into various school subjects, including Design and Technology, Technology and Living, Visual Arts, STEM education and Educational Technology. The learning content will be aimed at students who have no foundational knowledge in design and STEM topics, and will therefore be adaptable to different age groups. The mode of delivery will be hybrid, including both face-to-face design studio sessions with local stakeholders and online tutorials and critiques with international collaborators. As part of the design practice, the participants in both phases will work in groups to design and develop wearable technology innovations based on different real-world case studies. To encourage active engagement, the participants, using sponsored materials from Theory, will first need to learn how to do fashion design for themselves, after which they will be asked to engage in inclusive fashion design. The participants will be encouraged to design and create wearables by including smart textiles in the outfits they develop. This will enable them to better understand the differences and similarities between conventional design approaches and inclusive design approaches; it will also help them develop

empathy skills. The participants will be required to develop and present a prototype (conceptual, virtual or artefact) according to a design brief, with support from the project team.

### Indicative Content

#### 1) Smart Textiles

- Introduction to wearable technology in everyday life
- Introduction to smart textiles: Components, connections and applications
- Opportunities and challenges in wearable technology adoption and fabrication

#### 2) Inclusive Fashion Design

- Introduction to inclusive design: What is it and why is it needed?
- Design thinking and mind-mapping
- Fashion design fundamentals
- Principles of inclusive fashion design
- Inclusive fashion design using real-world scenarios and case studies (with HKSKHWC and OSL)

#### 3) Design Studio

- Hands-on fashion practice for ideation, development and prototyping

#### 4) Communication

- Knowledge communication skills via exhibitions and verbal pitching

### Learning Activities

The learning activities will be delivered in a hybrid fashion, which will maximise the participants' exposure to the cross-sector collaborators, help establish crucial networks and prepare them for sustainable modes of learning beyond conventional classroom contexts.

#### Face-To-Face Activities

- Design studio sessions comprising seminars, demonstrations, and creative practice
- Initial prototype presentation in a fashion show format
- School-based exhibitions for sharing and dissemination of final projects

#### Online Activities

- Tutorials with project staff and international staff trainers
- Project critiques, reviews, and discussions with cross-sector collaborators from HKSKHWC and HKDC

### Intended Learning Outcomes

Upon the completion of the project, the teacher participants will be able to do the following:

- 1) Apply design thinking with STEM content
- 2) Develop and facilitate effective STEM and fashion activities using school resources
- 3) Design and plan effective STEM learning activities pertinent to students who have little to no foundational knowledge of design or wearable technology
- 4) Maintain sustainable networks with cross-sector collaborators

Upon the completion of this project, the student participants will have

- 1) Gained foundational knowledge about the creative and inclusive application of technology
- 2) Gained practical experience and skills working with smart textiles and inclusive fashion
- 3) Gained exposure to inclusive fashion design and clothing challenges faced by vulnerable groups
- 4) Used interdisciplinary approaches to think critically and creatively while solving problems

### Project Schedule Overview

The proposed project will consist of a series of activities including seminars, design studio sessions, tutorials and critiques to be conducted with cross-sector collaborators. It will be conducted in two main phases. Phase 1 will focus on the teacher participants while Phase 2 will focus on the student participants.

#### Phase 1

Phase 1, targeting the participating secondary school teachers, will be delivered by the project team members (the applicant, a postdoctoral fellow and a research assistant) and an international staff trainer. Phase 1 will consist of a series of activities including an introductory seminar, four 3-hour design studio sessions that can be conducted over two full days, an online virtual exhibition and review session and online questionnaires. The two full-day studio sessions will be scheduled at least



one week apart to give the participants enough time to review the new content learnt in each session. After the completion of the Phase 1 activities, the participants will be able to give their feedback on these activities by answering online questionnaires and participating in interviews at their convenience. The Phase 1 activities will enable the teacher participants to do the following:

- Gain new knowledge about inclusive fashion design and smart textiles
- Participate in the project as learners and use the experience to inform their teaching processes in ways that are tailored to the learning and curriculum needs of their students and schools
- Gain ownership of the project by having access to a comprehensive curriculum, which they can adapt to the specific needs of their students, with the support of the project stakeholders

### Phase 2

Phase 2, targeting the student participants, will be delivered by the project team members (the applicant, a postdoctoral fellow and a research assistant), an international staff trainer and the secondary school teacher participants. The activities conducted during this phase will benefit both the teachers and the student participants. The participating teachers will be able to experience the curriculum from a student's perspective. This phase will create a collaborative dynamic whereby the students will be able to gain ideas from the project stakeholders and cross-sector collaborators. This will encourage the students to consider both process- and objective-driven innovations.

### Schedule of Activities

<b>Activity</b>	<b>Content</b>	<b>Parties involved</b>	<b>Delivery mode, venue</b>	<b>Expected Outcomes</b>
<u>Phase 1</u> Project introduction	<ul style="list-style-type: none"> <li>• Introduction to the project, the stakeholders, the schedule, the content and the online resources</li> <li>• Introduction to STEM and Inclusive Fashion applications</li> <li>• Tour of the HKSTP Experience Centre showcasing successful applications of creative thinking and STEM</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> <li>• Applicant</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• International staff trainer</li> <li>• HKSKHWC</li> <li>• Theory</li> <li>• HKFDA</li> <li>• HKSTP</li> </ul>	3-hour seminar  <b>Venue:</b> HKSTP	<ul style="list-style-type: none"> <li>• A basic understanding of the project's conceptual framework, content, stakeholders, schedule and supporting resources</li> <li>• The value and relevance of integrating STEM and creativity for innovation</li> </ul>
<u>Phase 1</u> Design Studio 1 (Morning)	<ul style="list-style-type: none"> <li>• Project introduction</li> <li>• Smart material exploration</li> </ul> <p>The exploration of smart materials will be conducted in three rotating sessions to present the following in small groups:</p> <ul style="list-style-type: none"> <li>○ Smart textile construction</li> <li>○ Components and technology</li> <li>○ Sewing applications of smart materials</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> <li>• Applicant</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• Student helpers</li> </ul>	3-hour design studio session  <b>Venue:</b> HKPolyU	<ul style="list-style-type: none"> <li>• Providing training and key knowledge on smart textiles and the basic fashion design process through a practical design studio demonstration and exploration</li> </ul>
<u>Phase 1</u> Design Studio 2 (Afternoon)	<ul style="list-style-type: none"> <li>• Fashion design process and exploration (designing for oneself)</li> <li>• Mini-fashion show and tell</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> <li>• Applicant</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• Student helpers</li> <li>• International staff trainer</li> </ul>	3-hour design studio session  <b>Venue:</b> HKPolyU	<ul style="list-style-type: none"> <li>• Providing training and key knowledge on the basic fashion design process through a practical design studio demonstration and exploration</li> <li>• An ice-breaker activity to consolidate the new knowledge acquired during the two studio sessions and bring together all participants from the different schools</li> </ul>

<p><u>Phase 1</u> Design Studio 3 (Morning)</p>	<ul style="list-style-type: none"> <li>• Real-world case studies developed with HKSKHWC</li> <li>• Inclusive fashion design principles</li> <li>• Defining design challenges</li> <li>• Brainstorming via mind-mapping and storyboarding with worksheet templates</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> <li>• Applicant</li> <li>• International staff trainer</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• Student helpers</li> <li>• HKSKHWC staff and case study users</li> </ul>	<p>3-hour design studio session</p> <p>Venue: HKPolyU</p>	<ul style="list-style-type: none"> <li>• Providing training and key knowledge on integrating real-world challenges with design practice</li> <li>• Case study sharing with actual users and council staff members</li> <li>• Ideation and design discussion with the local project team and international academics and practitioners</li> <li>• (For the teachers) Experience with project content through hands-on exploration and experimentation</li> </ul>
<p><u>Phase 1</u> Design Studio 4 (Afternoon)</p>	<ul style="list-style-type: none"> <li>• Prototype development</li> <li>• Preparation of presentation materials via project templates</li> <li>• Design tutorials with the project applicant and international staff trainers</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> <li>• Applicant</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• Student helpers</li> </ul>	<p>3-hour design studio session</p> <p>Venue: HKPolyU</p>	<ul style="list-style-type: none"> <li>• (For the teachers) Practical experience in integrating technological knowledge and design thinking to develop designs and prototypes</li> <li>• Refinement of project prototypes</li> </ul>
<p><u>Phase 1</u> Online virtual exhibition and final presentation with critique and review</p>	<ul style="list-style-type: none"> <li>• Final presentation and sharing of prototypes</li> <li>• Review and feedback with the project applicant and international staff trainers</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> <li>• Applicant</li> <li>• International staff trainers</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• Student helpers</li> </ul>	<p>2 hours</p> <p>Venue: Online</p>	<ul style="list-style-type: none"> <li>• (For the teachers) Practical experience in presenting creative STEM work in an exhibition format</li> <li>• Reflection on the knowledge acquired for all stakeholders to further refine the project brief and teaching content based on the needs of the teachers and their students</li> </ul>
<p><u>Phase 1</u> Project phase 1 review using an online questionnaire and interviews</p>	<ul style="list-style-type: none"> <li>• Online questionnaire with teacher participants</li> <li>• Interview with each school (face-to-face or online)</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> </ul>	<p>15 minutes for the online questionnaire</p> <p>30 minutes for the online interview</p>	<ul style="list-style-type: none"> <li>• Data gathering by the project applicant and staff on good teaching practices, skills and methods, which will contribute to the teaching materials, e-book, exhibition and final dissemination</li> </ul>
<p><u>Phase 2</u> Project introduction</p>	<ul style="list-style-type: none"> <li>• Introduction to the project, stakeholders, schedule, content and online resources</li> <li>• Introduction to STEM and Inclusive Fashion applications</li> <li>• Tour of the HKSTP Experience Centre</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> <li>• Student participants</li> <li>• Applicant</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• Student helpers</li> </ul>	<p>3 hours x 8 sessions (for each school)</p> <p>Venue: HKSTP</p>	<ul style="list-style-type: none"> <li>• Basic understanding of the project's conceptual framework, content, stakeholders, schedule and supporting resources</li> <li>• An understanding of the value and relevance of integrating STEM and creativity for innovation</li> </ul>

Phase 2 Design Studio 1 (Morning)	<ul style="list-style-type: none"> <li>• Project introduction</li> <li>• Smart material exploration via construction component integration and sewing applications</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> <li>• Student participants</li> <li>• Applicant</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• Student helpers</li> </ul>	3-hour design studio session x 8  Venue: At each secondary school	<ul style="list-style-type: none"> <li>• Establishing key knowledge about smart textiles through a practical design studio demonstration and exploration</li> </ul>
Phase 2 Design Studio 2 (Afternoon)	<ul style="list-style-type: none"> <li>• Fashion design process and exploration (designing for oneself)</li> <li>• Mini-fashion show and tell</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> <li>• Student participants</li> <li>• Applicant</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• Student helpers</li> </ul>	3 hours design studio session x 8  Venue: At each secondary school	<ul style="list-style-type: none"> <li>• Establishing key knowledge about the basic fashion design process through a practical design studio demonstration and exploration</li> <li>• An ice-breaker activity to consolidate the new knowledge acquired during the two studio sessions and bring together all participants</li> </ul>
Phase 2 Design Studio 3 (Morning)	<ul style="list-style-type: none"> <li>• Real-world cases studies developed with HKS KHC</li> <li>• Inclusive fashion design principles</li> <li>• Defining design challenges</li> <li>• Brainstorming via mind-mapping and storyboarding with worksheet templates</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> <li>• Student participants</li> <li>• Applicant</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• Student helpers</li> <li>• HKS KHC staff and case study users</li> </ul>	3-hour design studio session x 8  Venue: At each secondary school	<ul style="list-style-type: none"> <li>• Providing training and key knowledge on integrating real world challenges with design practice</li> <li>• Case study sharing with actual users and council staff</li> <li>• Ideation and design discussion with local project team and international academia and practitioners</li> <li>• (For the students) Experience with project content through hands-on exploration and experimentation</li> </ul>
Phase 2 Design Studio 4 (Afternoon)	<ul style="list-style-type: none"> <li>• Prototype development</li> <li>• Preparation of presentation materials via project templates</li> <li>• Design tutorials with the project applicant and international staff trainers</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher participants</li> <li>• Student participants</li> <li>• Applicant</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• Student helpers</li> </ul>	3-hour design studio session x 8  Venue: At each secondary school	<ul style="list-style-type: none"> <li>• (For the students) Practical experience in integrating technological knowledge and design thinking to develop designs and prototypes</li> <li>• Refinement of the project prototypes</li> </ul>
Phase 2 Critique and review	<ul style="list-style-type: none"> <li>• Critique and review of projects by the project collaborators</li> </ul>	<ul style="list-style-type: none"> <li>• Student participants</li> <li>• Teacher participants</li> <li>• Applicant</li> <li>• International trainer</li> <li>• Postdoctoral fellow</li> <li>• Research assistant</li> <li>• HKS KHC</li> </ul>	1-hour review x 8  Venue: Online session for each school	<ul style="list-style-type: none"> <li>• Valuable insights into the projects and suggestions for future work from cross-sector collaborators</li> </ul>

		<ul style="list-style-type: none"> <li>• HKFDA</li> </ul>		
<u>Phase 2</u> School-based exhibitions	<ul style="list-style-type: none"> <li>• Dissemination through exhibition presentations</li> </ul>	<ul style="list-style-type: none"> <li>• Student participants</li> <li>• Teacher participants</li> <li>• Applicant</li> <li>• Postdoctoral fellow</li> <li>• Research assistants</li> </ul>	1-month-long exhibition  Venue: Participating Schools	<ul style="list-style-type: none"> <li>• (For the students) Practical experience in presenting D-STEM work in an exhibition format</li> <li>• (For all stakeholders) A sense of ownership of the project that fuels interest in STEM and creativity-integrated learning</li> </ul>
<u>Phase 2</u> Project review using an online questionnaire	<ul style="list-style-type: none"> <li>• Online questionnaire with teacher participants</li> </ul>	<ul style="list-style-type: none"> <li>• Student participants</li> </ul>	15 minutes for the online questionnaire  Venue: Online	<ul style="list-style-type: none"> <li>• Data gathering by the project applicant and staff about good teaching practices, skills and methods, to be used in the teaching materials, e-book, exhibitions and final dissemination</li> </ul>

### Learning and Teaching Materials

The project will include the development of teaching and learning toolkits in physical and digital formats. The physical toolkits will be used during the design studio sessions to facilitate the ‘learn through making’ process. The participants will experiment and develop initial ideas using clothing to better understand how inclusive fashion design and smart textiles are used in the context of wearables. This will allow for a rapid ideation and prototyping process. The online toolkit will be available on the project website. It will contain key textual knowledge, fact sheets and case studies, giving the participants unlimited access to the project content at times and venues appropriate to their needs. In addition, the website will include updated information about the progress of the project, which will allow the participants to keep abreast of its latest developments, and online discussion forums, which will allow them to stay connected with each other. The materials will comprise the following:

<b>Online Toolkit</b>	
Teaching toolkit for teachers	Learning toolkit for students
<ol style="list-style-type: none"> <li>1. Fact sheet on inclusive design</li> <li>2. Fact sheet on fashion design</li> <li>3. Fact sheet on smart textiles</li> <li>4. Fact sheet on contemporary wearables</li> <li>5. Fact sheets on real-world case studies developed with HKSKHWC</li> <li>6. Teaching worksheets on creative brainstorming, design developments and presentations</li> <li>7. Detailed project briefs with guidelines</li> <li>8. List of recommended core and alternative activities</li> <li>9. Systematic schedule and content mapping of the workshop activities with recommended formats</li> <li>10. Teaching worksheets for creative brainstorming and presentations</li> </ol>	<ol style="list-style-type: none"> <li>1. Fact sheet on inclusive design</li> <li>2. Fact sheet on fashion design</li> <li>3. Fact sheet on smart textiles</li> <li>4. Fact sheet on contemporary wearables</li> <li>5. Fact sheets on real-world case studies developed with HKSKHWC</li> <li>6. Learning worksheets on creative brainstorming, design developments and presentations</li> </ol>

<b>Physical toolkit for design studio</b>	<b>Website</b>
<ol style="list-style-type: none"> <li>1. Smart textiles</li> <li>2. Components</li> <li>3. Construction kit</li> <li>4. POF fibres and yarn</li> <li>5. Materials (sponsored by Theory)</li> </ol>	<ol style="list-style-type: none"> <li>1. Reference materials and project examples</li> <li>2. Project news and updates</li> <li>3. Project information and details</li> <li>4. Schedules of the activities</li> <li>5. Discussion forums</li> <li>6. Project outcomes: e-book, exhibitions and videos</li> </ol>

### Additional Learning Support

- Website

The website will serve as an information retention and dissemination platform, through which stakeholders and the general public will have access to the project’s content and news.

●Microsoft Teams

Microsoft Teams will be used for the online tutorials, reviews, discussions and meetings. It is a common and accessible platform that can support a large number of participants.

●Online forum

An online forum administered by the project staff will serve as an online space for questions and quick response support during the project period.

**6. Implementation Plan**

Project Duration: June 2022–October 2023 (16 months)

Activities	Jun-Jul 2022	Aug-Oct 2022	Nov-Dec 2022	Jan-Feb 2023	Mar-Apr 2023	May-June 2023	July-Aug 2023	Sep-Oct 2023
Recruitment of staff and groundwork preparation	■	■						
Preparation of content, materials and studio coordination		■	■					
Website launch (with basic information and contact details)		■						
Project introduction to teacher participants with project staff and collaborators		■	■					
Design studio for teachers; administer the user feedback questionnaire; refine teaching materials according to feedback		■	■					
Design studio for students with teachers; administer the user feedback questionnaire				■	■	■	■	
All participants to continue working on the project at their schools				■	■	■	■	
Review and critique sessions with cross-sector collaborators				■	■	■	■	
Initial design of the e-book, exhibition materials and finalisation of online toolkits						■	■	
In-school sessions with teachers and students to refine their projects with the support of the applicant and project staff						■	■	
Final refinement of project outputs and content for the website and exhibitions						■	■	■
School-based exhibitions						■	■	■
Documentation and analysis of collated data from questionnaires and interviews							■	■
Updating and uploading of content to the website			■	■	■	■	■	■
Consolidation and preparation of the concluding project report								■

**7. Expected Project Outcomes**

The expected project outcomes are as follows:

- For the teachers to acquire the knowledge and skills needed to deliver a curriculum that integrates STEM and creative thinking through the study of inclusive fashion design and smart textiles, which can be conducted in a hybrid mode comprising design studio practice and online components
- For the students to acquire core knowledge in STEM; develop creative skills in innovation ideation, inclusive design and communication; and develop empathetic mindsets and positive attitudes for real-world problem solving
- The development of comprehensive teaching materials, videos and an exhibition, which can serve as reference materials for local and international secondary school teachers who want to implement novel STEM content.
- For the teachers and students to gain a supportive network of cross-sector collaborators, which will contribute to the positive and sustainable continuation of a curriculum that integrates STEM and creativity
- For the teachers and students to undergo teaching and learning experiences beyond conventional classroom settings and acquire innovation skills through creative practice

## 8. Involvement of Teachers and Principals

Teachers and principals will be invited to support the implementation of the project in the following ways:

- Coordinate the schedules and venues for student workshops and exhibitions at each school
- Engage in the workshops, activities, exhibitions, and questionnaires in their roles as coordinators, guides, facilitators, and participants
- Disseminate information about the project via the school website and social media channels
- Administer the student feedback questionnaire and implement the school-based exhibitions, the content of which will be developed by all the stakeholders

## 9. Budget

Budget	Amount
<b>Staff Costs</b>	
<ul style="list-style-type: none"> <li>• <u>Postdoctoral fellow</u> HK\$38,000 x 16 months + 5% MPF (HK\$1,900/month x 16)</li> </ul>	HK\$638,400
<ul style="list-style-type: none"> <li>• <u>Research assistant</u> HK\$20,000 x 16 months + 5% MPF (HK\$1,000/month x 16)</li> </ul>	HK\$336,000
<ul style="list-style-type: none"> <li>• <u>Student helpers</u> (hourly basis at HK\$70/hr) 4 student helpers x 16 hrs (Phase 1: four 3-hour design studio sessions held over 2 days) 4 student helpers x 128 hrs (Phase 2: four 3-hour design studio sessions at each of the 8 schools)</li> </ul>	HK\$4,480 HK\$35,840
<ul style="list-style-type: none"> <li>• <u>Sewing technician (Hourly Basis at HK\$100/hr)</u> 1 technician x 144 hrs (all design studio sessions) x 100</li> </ul>	HK\$14,400
<b>Total Staff Costs</b>	<b>HK\$1,029,120</b>
Services:	
<ul style="list-style-type: none"> <li>• <u>Staff trainer for teachers' workshop</u> - Lecturer fees x 2 Teachers' workshops HK\$1,200 x 2 design studio x 6 hrs</li> </ul>	HK\$24,480
<ul style="list-style-type: none"> <li>• <u>Staff trainer for students' workshop</u> - Lecturer fees Students' workshops HK\$880 x 16 workshops x 6 hrs</li> </ul>	HK\$84,480
<ul style="list-style-type: none"> <li>• <u>Website</u> - Website design - Bilingual editing and Chinese translation of key content - E-book design - Photography and video recording of workshops - Video editing</li> </ul>	HK\$40,000 HK\$20,000 HK\$50,000 HK\$50,000 HK\$50,000
<ul style="list-style-type: none"> <li>• <u>Exhibitions (school-based exhibitions)</u> - Exhibition production fees for all schools (inclusive of display props and delivery costs) - Photography of prototypes HK\$5,000 x 8</li> </ul>	HK\$50,000 HK\$40,000
<b>Total for services</b>	<b>HK\$408,960</b>
<b>General Expenses</b>	
<ul style="list-style-type: none"> <li>• <u>Audit fees</u></li> </ul>	HK\$15,000
<ul style="list-style-type: none"> <li>• <u>Materials for creative studio</u>: POF materials, art supplies, components, drawing materials, paper, stationery, printing</li> </ul>	HK\$75,000
<ul style="list-style-type: none"> <li>• <u>Transportation fees (transportation of the studio and exhibition materials to the schools)</u></li> </ul>	HK\$4,000
<ul style="list-style-type: none"> <li>• <u>Transportation fees (bus fees for transporting the students to HKSTP)</u></li> </ul>	HK\$20,000
<ul style="list-style-type: none"> <li>• <u>Transportation fees (for the HKSKHWC staff and elderly case study users to design studio sessions)</u></li> </ul>	HK\$8,000
<ul style="list-style-type: none"> <li>• <u>Online survey software (to create, send and analyse the questionnaires)</u></li> </ul>	HK\$4,000
<b>Total for general expenses</b>	<b>HK\$126,000</b>
<b>Subtotal</b>	<b>HK\$1,564,080</b>
<b>Other Expenses</b>	
<ul style="list-style-type: none"> <li>• Administrative overhead charges (15% of funding for university overheads to cover research and financial administration)</li> </ul>	HK\$234,612
<b>Total Funding Requested</b>	<b>HK\$1,798,692</b>

Justification of the Requested Funds

### Staff

Postdoctoral Fellow A postdoctoral fellow will be employed to work full time throughout the entire project duration. He/she will work with the project applicant and all stakeholders. He/she will support the administration and co-ordination of the activities, content development, implementation and monitoring of the finances. It is expected that the postdoctoral fellow will hold a PhD in design research or education, have prior teaching experience and have a good command of English and Chinese.

Research Assistant A research assistant will work with the postdoctoral fellow to assist with the administration, activities, content, materials and website updates of the project. The research assistant will be expected to have an undergraduate degree relevant to design, wearable technology or electronic engineering, have good social media literacy and have a good command of English and Chinese.

Student Helpers Student helpers will be engaged on a part-time basis. Four helpers will be required for the pre- and post-preparation and the duration of all of the design studio sessions. They will assist the project staff with the preparation of the venues and materials and assist with the practical demonstrations for the participants. Helpers with design backgrounds will be recruited from among the PolyU students. The hourly rate differs from the QEF guidelines as PolyU's minimum rate for student helpers is set at HK\$70/hr.

Sewing Technician A technician with industrial sewing experience will assist with the construction of the project prototypes.

### **Services**

International staff trainers International staff trainers will be engaged to provide design instruction and tutorials via video conferencing for the teacher and student participants. The international staff trainers will be teaching staff from RCA or OSL. They will be supported online by the project applicant and the project staff. This will ensure that all participants will be able to gain knowledge and insights from international experts without being hindered by COVID-19-related travel restrictions.

Website Services will be engaged to design, upload content to and maintain a comprehensive website that will contain project information, materials, deliverables and outputs. It will be necessary to pay for related services: bilingual editing, website design, e-book design, photography, video recording and video editing. These services will be necessary for the effective recording and documentation of the project. The website will be necessary to ensure maximum international and local reach and impact on the project beneficiaries.

School-Based Exhibitions Exhibitions will be held at the participating schools. The exhibitions will allow the participants to consolidate, review and disseminate their new knowledge and creative innovations. The participants will use the exhibitions as part of the teaching and learning process.

### **General Expenses**

Audit Fees Audit fees will be required for the independent examination of the financial statements and funds used for the project.

Materials Consumable materials and services such as POF materials, components, stationery, printing and travel costs for exhibitions will be necessary for the delivery of the project content.

Transportation Fees The transportation fees will be to transport bulky material exhibits and display boards to secondary schools for workshops and exhibitions. The fees will also be necessary to help transport students and HKSKHWC stakeholders to the project activities.

Online survey software A subscription to online survey software will facilitate the evaluation of the project via mass surveys administered to the project participants. This will allow for the efficient analysis of the data for review and dissemination.

### **Other Expenses**

Administrative overhead charges This refers to PolyU's mandatory overhead charges for non-UGC funded activities that require support from the university's administrative and supporting units.

## **10. Project Evaluation**

The project will be evaluated using both qualitative and quantitative methods, as detailed below.

Interviews. Interviews will be conducted with the teachers before the workshops to gain a better understanding of the existing relevant curricula (STEM, design and creativity), students' previous exposure to STEM and the learning

environments. The discussions will be conducted in a semi-structured format to encourage the participants to actively communicate and share their experiences. The primary purpose of the interviews will be to understand the needs and curriculum gaps pertinent to each school with a view to designing teaching materials that will be applicable to all participants.

Participant Feedback Questionnaires. The teacher and student participants of the workshops and seminars will be asked to provide feedback through digital survey questionnaires. The initial survey for the teachers and the survey for the students will solicit their general impressions of the workshops’ environment, content, materials, and delivery. The final survey for the teachers will focus on the design of the teaching and learning materials, the students’ responses and the support provided by the website and the project team. The data will be collected, analysed, and will contribute to the refinement of the teaching materials and workshop content for the next phase of activities. This will enable a reflective process that improves and adapts to the specific needs of the project beneficiaries.

Project Review by Cross-Sector Collaborators. As part of the design studio sessions, all of the participants will be required to design and develop wearables for vulnerable users based on real-world case studies. Cross-sector collaborators and the members of the project team will share their insights and critique the proposed designs. They will provide direct feedback to the teachers and students, which will contribute to their professional and academic development.

### 11. Sustainability

- A website will be developed containing teaching materials, the e-book, videos, the exhibition content and the outputs. It will be accessible to the participants, collaborators and the general public. It will serve as a point of reference and discussion for schools that did not take part in the programme but would like to explore D-STEM within their curricula.
- Crucial partnerships will be formed within the project. The curricula in secondary schools will be further enriched through discussion and the feedback from industry professionals, the professional community and higher education academics, members of sectors that are potential destinations for secondary school students. All of the stakeholders and the potential schools interested in exploring D-STEM using the resources available on the website will be able to connect with the collaborators through their contact details, which will be provided on the website.
- The schools, teachers and student participants, together with the applicant and collaborators, will be encouraged to disseminate information about the project with other schools at different education levels to ensure maximum impact and reach on the local educational environment.

### 12. Dissemination/Promotion of Project Outcomes

- E-book about the project. The e-book will serve as a summary of the content of the project with supporting information from the collected data and analysis.
- Online teaching and learning toolkits. Teaching materials and resources: Inclusive of guides and notes that were disseminated during the workshop.
- School-based exhibitions. Individual exhibitions will be held at each participating secondary school. The project team will assist each school to design and develop exhibition materials pertinent to each venue.
- Social media. Information about the project will be shared on the social media channels of the applicant and collaborators and through shared links to the project’s website; this will allow information about the project to be disseminated widely within international/national academia, industry and professional communities.
- Videos of workshops. Two edited short videos of the design studio sessions in Phases 1 and 2 will be made. The videos will be posted on the website to disseminate the project outcomes, responses and good practices.
- Website. The website will provide all relevant information and supporting content materials relating to the project.

### 13. The Asset Usage Plan

No equipment and assets will be purchased for this project.

### 14. Report Submission Schedule

The Grantee commits to submit the reports in strict accordance with the following schedule:

Project Management		Financial Management	
Type of report and period covered	Report due date	Type of report and period covered	Report due date
<u>Progress report</u> :01/06-31/12/2022	31/01/2023	<u>Interim financial report</u> :01/06-31/12/2022	31/01/2023
<u>Progress report</u> :31/12-30/06/2023	31/07/2023	<u>Interim financial report</u> :31/12-30/06/2023	31/07/2023
<u>Final report</u> :31/07–31/10/2023	31/01/2024	<u>Final financial report</u> :31/07-31/10/2023	31/01/2024

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## Theory



14<sup>th</sup> September 2021

Dear Dr. Jeanne Tan,

**Re: Support and sponsorship for Quality Education Fund Proposal**

We are happy to support your proposal bid for the Quality Education Fund entitled "Fashioning STEM for Good: Inclusive fashion design and smart textiles for social good". The main organisers of the proposed project are the Hong Kong Polytechnic University (ITC) and the Laboratory for Artificial Intelligence in Design. Theory will sponsor the project with HKD\$200,000 worth of past season clothing and materials for participants to practice application of smart materials in fashion.

Please do not hesitate to contact me for further queries.

Yours sincerely,

  
  
 Kelly Tan  
 Marketing & PR Manager

Theory HK  
 LK International (HK) Limited

Date :- 1<sup>st</sup> November 2021

Dear Dr. Jeanne Tan,

**Re: Collaboration for Quality Education Fund Proposal**

We are happy to support your proposal bid as collaborator for the Quality Education Fund entitled: "Fashioning STEM for Good: Inclusive fashion design and smart textiles for social good". The main organizers of this proposal are Hong Kong polytechnic University (ITC) and the Laboratory for Artificial Intelligence in Design (AIDLab).

Please do not hesitate to contact me for further queries.

Yours sincerely,

Mr Kevin Yeung  
 Chairman - Hong Kong Fashion Designers Association