RGC Ref. No.:
UGC/IDS25/16
(please insert ref. above)

RESEARCH GRANTS COUNCIL
COMPETITIVE RESEARCH FUNDING SCHEMES FOR THE LOCAL SELF-FINANCING DEGREE SECTOR

INSTITUTIONAL DEVELOPMENT SCHEME (IDS)
RESEARCH INFRASTRUCTURE GRANT

Completion Report

(for completed projects only)

Submission Deadlines:
1. *Auditor's report with unspent balance, if any: within **six** months of the approved project completion date.*
2. *Completion report: within **12** months of the approved project completion date.*

Important Note:
In completing the report, please use the following format:

Page limit:	Items 1 to 5 and Summary of Completion Report: no page limit Items 6 to 9: maximum **20 A4 pages** (excluding any appendices and attachments)
Font:	Times New Roman
Font Size:	**Not smaller** than Point 12
Margin:	Two centimeters margin all around
Spacing:	Single-line spacing

1. Project Title

Research on Sustainable Living: Phase Two of the Capacity Building Plan

2. Investigator(s) and Academic Department(s) / Unit(s) Involved#

Project Team	Name / Post	Department / Unit	Average Number of Hours Per Week Spent on this Project
Project holder* (i.e. Head of Institution)	Prof. HONG Christina[1] / President	THEi	2
Team leader	Prof. HO Chi Wing Daniel / Professor	Environment / Faculty of Design and Environment / THEi	7
Team member (s)	Prof. CHEN Hung Chi Leslie / Dean	Faculty of Design and Environment / THEi	4
	Ms. CHU Wai Ching Alice / Associate Professor	Design / Faculty of Design and Environment / THEi	7
	Dr KEE Yee Chun Tristance / Associate Professor	Design / Faculty of Design and Environment / THEi	7

	Dr KWAN Tracy Tak Ching / Research Manager	Research Office / THEi	11
	Dr ZHANG Hao Allen / Associate Professor	Environment / Faculty of Design and Environment / THEi	7

[#] *Please state the **key** staff and department/unit involved in the project. Please add row(s) as necessary. Please also highlight the approved changes in project team composition and quote the date of the RGC approval for such changes.*

[*] *Refer to "Applicant" for 2015/16 exercise and "Project holder" for 2017/18 exercise onwards.*

[1] The Applicant was changed from Prof David LIM to Prof Christina HONG with the RGC's approval obtained on 24 Jan 2017.

3. Project Duration

	Original	**Revised**	**Date of RGC / Institution Approval** *(must be quoted)*
Project Start Date	01/01/2017	01/04/2017	13/01/2017
Project Completion Date	31/12/2019	31/03/2020 30/09/2020	13/01/2017 17/04/2020
Duration *(in month)*	36	42	17/04/2020
Deadline for Submission of Completion Report	31/12/2020	31/03/2021 30/09/2021	13/01/2017 17/04/2020

4. Project Objectives

Summary of objectives addressed / achieved:

Objectives*	Percentage Achieved	Remarks**
General Research Capacity Development Plan 1. To improve the knowledge and skills of academic staff, especially those in their early careers, to develop and write research proposals	100%	• An English proofreading service has been in place since Year 1 to help staff improve the English quality of their proposals and publications. This service was available throughout the project period and continues after project completion. • A series of workshops on research writing skills was organized in Year 2. The workshops were initially planned to be repeated in Year 3 but had to be cancelled due to the class suspension related to the social unrest and COVID-19 pandemic.
2. To promote peer review, knowledge exchange and networking among staff researchers	100%	• A pre-submission proposal peer review scheme was launched in 2018. • The Research Support Centre (RSC) organized /co-organized the following during the project period: o a staff research symposium in 2018 o an international research conference in 2019 o eight research seminars were organized. The organization of research seminar continues on a quarterly basis after project completion.
3. To enhance the accessibility of research findings for staff and students	100%	• Subscription of electronic journals not available in the VTC libraries has been completed. These journals have been made available for access by staff and students throughout the project period. • RSC launched a service of depositing all journal publications and conference papers arising from funded research projects into the THEi Research Repository for researchers starting from June 2020. • A display window was constructed outside the RSC to

Objectives*	Percentage Achieved	Remarks**
		showcase research posters by staff and students.
4. To encourage and support students engaging in research	100%	• The first student research poster presentation was organized in 2019. • The second student presentation was organized in August 2020. This was an online event due to the COVID pandemic. The organization of this event continues after project completion. • A number of work stations in the RSC are designated for students' use.
5. To improve the research facilities for staff and students	100%	• The RSC was established in 2018. Its facilities have been made available for use by staff and students since then. Usage rate has dropped significantly in 2019 and 2020 due to face-to-face class suspension as a result of the social unrest and COVID-19 pandemic. • Enhancements were made to the electronic research management system "Sophia" – a web-based interactive platform used by researchers and administration – to improve its efficiency and user-friendliness.
Sustainable Living Research Capacity Development Plan 6. To establish the second strategic research centre that is called "Centre for Sustainable Design and Environment (CSDE)" to enable research and development, knowledge exchange, and education in the areas of sustainable design and environment;	100%	• Physical entity of the CSDE/SIDL has been set up at Room S311, and SLEL at Room N1160 of THEi Chai Wan Campus.
7. To promote interest and collaboration among academics and external stakeholders in different disciplines;	100%	• Programme Leaders from different areas within THEi, including Surveying (SUV), Horticulture and Landscape Management (HLM), Fashion Design (FD) and Product Design (PD) have been appointed as Research/Unit Managers to coordinate and oversee the research activities of various labs and unit of the CSDE. • 25 seminars have been organized to promote interest and collaboration of colleagues and external stakeholders.

Objectives*	**Percentage Achieved**	**Remarks****
8. To develop the potential of sustainable innovation by discovering new knowledge and enhancement in sustainable practices with the infusion of design and technology;	100%	• 14 exhibitions and 2 workshops for public, and 13 student training workshops in the theme of sustainability were organized. • 13 training workshops were developed for students to equip their skillset for technical knowledge. The students are expected to integrate the knowledge with their design as sustainable design practices. • 3 training workshops were developed for academic staff to introduce new equipment/technology to stimulate the staff for new research direction.
9. To explore the adoption of eco-landscaping management for promoting sustainable urban landscaping and biodiversity;	100%	• 12 out of the 25 seminars are related to sustainable urban design, landscaping, and biodiversity
10. To develop academics' expertise into research strength;	100%	• 25 RGC (FDS and IIDS) proposals were developed and submitted in the theme of sustainable living, 10 were granted in the project period. Total approved amount over 6.3M. • 6 research proposals were submitted to various external funding schemes including ECF, PASS, EECA and OEP. 3 granted with total amount about 0.67M. • 12 THEi Seed Grant proposals were developed, 11 were granted.
11. To provide a forum for showcasing prototypes of new designs and research findings	100%	• Display windows and boards have been set up to showcase prototypes of new designs, research equipment and research findings in CSDE. • Part of the physical entity of SIDL was designed to be used as an exhibition area for showcasing prototypes of new designs. • An exhibition was held to showcase the prototypes of new design from fashion to product and the research posters generated from the project.
12. To establish an education and training platform for students and the general public to enhance their awareness of the importance of	100%	• CSDE works as a knowledge platform of sustainable living to THEi staff, students, and the general public.

Objectives[*]	**Percentage Achieved**	**Remarks**[**]
green and sustainable living.		• 24 School talks, 25 seminars, 16 training workshops (13 for students and 3 for staff), 14 exhibition and 2 workshops for the general public and 5 taster programmes were developed in the project period. • Official website of CSDE was launched. Upcoming activities, equipment and other information of CSDE will be published on the website. Students and the public can access the website to receive the most updated information about greening and sustainable living.

[*] *Please refer to the originally approved objectives. If there are changes in objectives, please highlight the changes and quote the date of RGC approval for such changes.*
[**] *Please provide reasons for significant slower rate of progress when compared with the approved implementation timetable.*

6. Research Outputs

6.1 What are the accomplishments of the project?

(i) Please provide reports on conference, seminar, workshop, exchange programmes or other activities held (if applicable).
(Please provide details of the activities organized, including the theme / objectives of the activities, targeted participants, attendance, analysis of participants, e.g. country of origin, research background, etc., evaluation forms of the activities and a summary of the participants' evaluation. Photos of the activities are preferred.)

Details of the activities organized from 1/4/2020 to 30/9/2020 are listed below. For those organized during the period of 1/4/2017 to 31/3/2020, please refer to the progress reports previously submitted to the RGC.

a) International Conference

Due to the Covid-19 pandemic, the International Conference on Sustainable Design and Environment 2020 (ICSDE 2020), which had been scheduled to be held on 27 and 28 Feb 2020 at THEi Chai Wan campus, was modified and arranged as a one-day online event. The virtual ICSDE 2020 was held on 6 August 2020. The conference has attracted academics, industry partners, researchers, and students who share a common interest in interdisciplinary research on sustainability. Over 250 delegates all over the world joined the conference to exchange the knowledge of sustainability research, as well as

share the global trend on research directions and new tools for analysis.

In the event, four distinguished scholars from Australia, the United Kingdom, Taiwan and Hong Kong, have delivered keynote addresses surrounding the topic of sustainable living in different aspects, which have received an enthusiastic appeal from the online audience:

	Keynote Title	Guest Speaker
1	Intelligent Manufacturing Technologies – Past, Present and the Future	Prof Alan Kin-Tak Lau, Pro-Vice-Chancellor (Research Performance and Development), Swinburne University of Technology
2	Global Sustainability in the Fashion and Textiles Supply Chain from a UK perspective	Dr Julie King, Deputy Dean, Faculty of Creative Industries, University of South Wales
3	The Role of Wood Utilization in Sustainable Forestry – The Example of the Experimental Forest, National Taiwan University	Prof Ming-Jer Tsai, Associate Dean of the College of Bioresources and Agriculture & Director of the Experimental Forest, National Taiwan University
4	A Revelation of Three Pillars	Prof Stephen Lau, Honorary Professor, The University of Hong Kong Visiting Professor, Beijing University of Civil Engineering & Architecture

The conference also hosted a panel discussion, titled "*Rethinking Sustainable Living amidst the COVID19 Pandemic*" to discuss the challenges and opportunities on sustainability that came along with the outbreak.

There were 20 oral presentations in three parallel presentation sessions, authored by researchers coming from Hong Kong, India, Indonesia, Nigeria and the United Kingdom, which shed lights on the latest innovations and ideas from different continents in promoting and enhancing sustainability ideas in multiple areas of contemporary living.

Feedback of the participants was generally positive. The average evaluation score, when asked whether the conference was well organized and had met their expectation, were 4.67 and 4.10 respectively, on a scale of 1 to 5 with 1 = 'strongly disagree' and 5= 'strongly agree'.

An electronic book of programme and abstracts has been published online which can be viewed and downloaded at:
https://online.flippingbook.com/view/186529/.

b) VR Exhibition

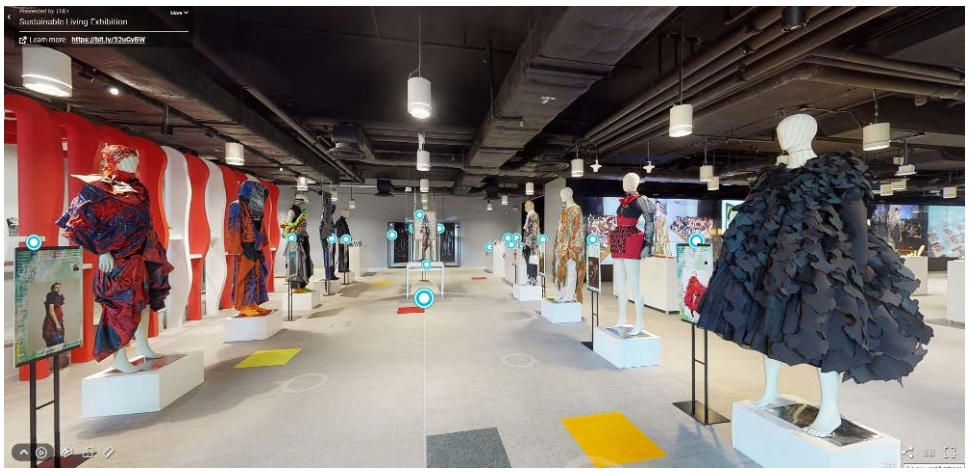
The exhibition originally held between 27/2/2020 – 13/3/2020 was postponed and transferred to a virtual reality exhibition with the agreement from the UGC due to the outbreak of Covid-19.

The VR exhibition was built based on a physical exhibition on 17/8/2020, over 50 items designed by staff and student with the theme of sustainability were

displayed and introduced in the exhibition. Research posters for seed grant projects developed with the support of the centre in 2019 were presented in the exhibition.

Two winning teams in student start-up programme (Innov8) of THEi have joined the exhibition. The centre had provided technical support in handling and processing of recycled materials for their works' prototype development.

VR exhibition: https://my.matterport.com/show/?m=N8Labh9iA3F



c) Student Applied Research Presentations 2020

An online Student Applied Research Presentations was hosted on the THEi website in August 2020 due to the COVID-19 pandemic. The event received 41 abstracts, 31 research posters and 7 video presentations from students across all faculties.

Over 1,700 visitors viewed the students' work during the period of 1 – 10 August 2020. A competition for the Best Posters Awards and Best Video Presentation Award was organized. About 300 visitors voted including THEi students and staff, and visitors from other local or overseas institutions. The presentations were made available for view until August 2021. The promotional posters and webpage screen captures can be seen in Appendices 1 & 4.

In addition to the online display, a poster exhibition was held in THEi Chai Wan campus in November 2020 when face-to-face classes were partially resumed. (please refer to Appendices 5a & 5b)

(ii) Please provide reports on asset purchase such as acquisition of research facilities, communal equipment, software licence, dataset and / or status of infrastructure / physical research structure building such as research centre, research supporting unit (if applicable).
(Please provide supporting documents and / or photos, and provide the utilization rate.)

General Research Capacity Development

A Research Support Centre (RSC) was established in 2018, with the aim of providing a communal workspace with individual work-stations for research support staff and students to work on their projects. The RSC is equipped with 23 computer stations and a digital copier, and the statistical software SPSS and NVivo are installed in some stations. Usage of RSC was adversely affected by the social arrest in 2019 and COVID-19 pandemic in 2020. Throughout the project period, the RSC has housed 25 research assistants, and 61 students. The RSC continues to operate after project completion and is managed by the THEi Research Office. Photos of the RSC can be seen in Year 1's progress report submitted to the RGC.

Project funding was used to purchase 10 NVivo licenses since Year 1 and during the project period, they had been used by 15 research projects. The NVivo licenses are perpetual licenses hence they remain available for use after project completion. In addition, SPSS user licenses were subscribed on an annual basis during the project period upon researchers' requests. In the year 2019/20, 46 SPSS licenses were subscribed.

56 research reference books were purchased and placed in THEi's Learning Commons for access by staff and students. For a full list of the books, please refer to Year 3's progress report.

Each year during the project period, 31 academic e-journals which were unavailable at THEi and were requested by academic staff were subscribed in Year 1 and had been renewed in Year 2 and 3. These journals were available for access by all

THEi staff and students. For a full list of the e-journals subscribed, please refer to Year 1's progress report.

Centre for Sustainable Design and Environment (CSDE)

A Centre for Sustainable Design and Environment (CSDE) was established under the IDS project. The centre is managed by Faculty of Design and Environment (FDE) of THEi.

Below asset was purchased for the CSDE:

	Item	Brand/Model
1	Laser Cutting System for Textiles Products	Universal Laser System / iLS 12.75
2	Full Body Scanner	Styku / 150FH
3	Handheld Scanner	Artec3D / EVA+
4	Motion Capturing System	Noraxon / Myomotion
5	Multi-material 3D printer	Stratasys / Objet350 Connex3
6	CNC Router	Zund / M-2500
7	Resistograph	IML/ RESI PD1000
8	Tree-pulling System	TreeQinetic
9	Drones	DJI / Inspire 2 Parrot / Disco Pro AG Parrot / Bebop 2 3D Modelling
10	Handheld GPS Devices	Garmin / GPSMAP 276CX Garmin / Montana 680t
11	Laser Rangefinders	Laser Technology / TruPulse 200M/200L

Please refer to Appendix 6 for photos and utilization rate.

(iii) Please provide reports on research activities carried out (if applicable).

Please see Appendices 7 to 14.

6.2 Please describe where and how the IDS Research Infrastructure Grant project assisted in building up the research capacity of the institution in its strategic areas (e.g. has the IDS Research Infrastructure Grant project facilitated the academics in formulating their research proposals under the Faculty Development Scheme, etc.).

General Research Capacity Development

Apart from the provision of facilities for staff and students to work on their research projects, the Research Support Centre (RSC) has organized the following activities to help build the Institute's general research capacity:

1. Improving the English quality of research writings

The following activity and service were provided by RSC with the aim of improving comprehensibility and readability of research proposals and reports:

- A series of writing workshops were organized to help academic to improve their English writing skills especially in the area of writing abstract, literature review

and research methodology. The workshops were well received by the participants who found the activities useful and important for their work.

- An in-house English proofreading service has been launched since Year 1 for all THEi staff. During the project period, over 400 pieces of writing had been proofread including 90 external research grant proposals, 31 manuscripts for consideration for publication, and other research pieces by staff and students.

2. Facilitating knowledge exchange and research networking

Eight research seminars were organized during the project period, with THEi researchers from across faculties presenting their research work to staff and students. In addition, two institute-wide research symposiums for staff and one for student had be held.

Centre for Sustainable Design and Environment (CSDE)

1. Conference support

The project provided financial support to academic staff to attend academic conference, present their research outcome and extend their academic network.

10 rounds of call for application were sent, 15 academic staff were supported to attend international conference. Due to the outbreak of Covid-19, most conferences scheduled in Feb-Sep 2020 were postponed or cancelled and therefore the number of conference attendance in year 3 is 5, instead of 10 in the original plan.

2. Development of seed grant proposals

12 seed grant proposals were developed in the reporting period, part of these proposals was developed with support from CSDE in two directions: research facilities and research officers. Some research projects will not be established without facilities built by this project. The research officers, in another way, share their experience and knowledge in preparing research plan and proposal, as well as budget arrangement with the academic staff especially for these in junior year. 11 seed grant proposals were granted in the project period.

3. Development of research proposals from external grant schemes

The IDS Research Infrastructure Grant project facilitated academic staff to formulating their research proposals under various RGC grant schemes, 25 RGC (FDS and IIDS) proposals were developed and submitted in the theme of sustainable living, 10 out of the 25 proposals were granted in the project period. Total approved amount over $6.3 M (please see Appendix 15). Besides of RGC, 6 research proposals were submitted to various funding schemes, 3 granted with total amount about $0.67M.

4. Develop course modules and student research projects related to sustainable living

Some of the equipment purchased by the project were implemented in course modules and students' research projects, the concept of sustainable living is also added into some course modules.

Programme	Course	Content
Fashion Design	Dissertation	Using special equipment (laser

	1. The influence of fair trade practice on the fashion buying behaviour of Hong Kong youngster 2. Factors affecting the consumption behavior of Hong Kong Generation Z in sustainable fashion	cutting system and CNC routing system) in sustainable fashion design project Zero-waste pattern design
Horticulture and Landscape Management (HLM)	N/A	Use of digital maps and GPS
Product Design (PD)	DPD5047 – Lighting Design and Technology	Lighting design by sustainable materials such as paper and wood, and process by CNC and laser cutting system
Surveying	DSU5406 Graduation Project 2: Thesis Report	Use of drones in building survey

6.3 If the project has not met its original objectives, why?

NIL

6.4 (a) Please provide details e.g., title, authorship, publication dates, etc. and attach an abstract of each publication reported. Please place asterisks on publications involving inter-institutional collaborations.

(Please refer to Appendix 16 for the abstracts/excerpts of recently published papers/chapters. Please also refer to previously submitted progress reports for other publications.)

Book chapter:

1. Shi, S.L. (2019). Chapter 9: Contribution of Affordable Housing Projects to Green Network in Compact Cities A Hong Kong Case in A. Olanrewaju, Z. Shari, and Z. Gou *(Ed.), Greening Affordable Housing: An Interactive Approach* (pp. 138 - 153) New York, NY: CRC Press.

2. Chen, A.P., Chu W.C., and Chan C.T. (2020). The Relationship between the Aesthetic Attributes of Sports Bras Design and the 3D Body Measurements of Generation Y Females in Hong Kong in C. Hong and W.K. Ma (Ed.), *Applied Degree Education Applied Degree Education and the Future of Work*. Singapore: Springer Singapore.

Referred Journal Articles:

1. Kee, T., & King, A. (2018). Impact of Sustainable Product Design on Elderly

Ergonomics. *Ergonomics International Journal*, 2(8): 000168. Doi: 10.23880/eoij-16000168

2. Kee, T. (2018). Sustainable Place-Making in Hong Kong: Transforming Urban Crisis to Urban Renewal Opportunities. *US-China Education Review B*, 8(2): 47-66. Doi: 10.17265/2161-6248/2018.02.001

3. Po Ying Lai, C.Y. Jim, Guang Da Tang, Wen Jun Hong, Hao Zhang. 2019. Spatial differentiation of heritage trees in the rapidly-urbanizing city of Shenzhen, China. Landscape and Urban Planning 181:148-156

4. Kee. T., & Chau K.W. (2020). Adaptive reuse of heritage architecture and its external effect on sustainable built environment – Hedonic pricing model and case studies in Hong Kong. Sustainable Development, Early View. https://doi.org/10.1002/sd.2108

5. N L Chau, CY Jim, Hao Zhang. 2020. Species-specific holistic assessment of tree structure and defects in urban Hong Kong. Urban Forestry and Urban Greening 55:126813

6. Louis Lee, CY Jim, Hao Zhang. 2019. Tree density and diversity in Hong Kong's public housing estates: From provision injustice to socio-ecological inclusiveness. Urban Forestry and Urban Greening 46:126468

7. LC Hui, CY Jim, Hao Zhang. 2020. Allometry of urban trees in subtropical Hong Kong and effects of habitat types. Landscape Ecology 35:1143-1160

8. Po Ying Lai, C.Y. Jim, Hao Zhang. 2020. Heritage trees in Macau: Relationships among biomass structure, age, and ecosystem services. Arboriculture and Urban Forestry 46:109-134

9. Sifeng Wang, Hao Zhang. 2021. Tree composition and diversity in relation to urban park history in Hong Kong, China. Urban Forestry and Urban Greening (Accepted with major review required)

10. Ho, Daniel C.W., Lai, Lawrence, W.C. & Wang, A. (2020) The effects of "publicness" and quality of publicly accessible open space upon user satisfaction, Environment and Planning B: Urban Analytics and City Science, Sage Publications, London, [ISSN: 2399-8083/2399-8091]. (published online on 18 Feb. 2020)

Conference papers:

1. Chau, N.L. (2019) Evaluation of Slope Greening Performance in Promoting the Urban Ecology of Hong Kong. IICEHawaii 2019/IICSEEHawaii 2019, 3 – 5 Jan 2019, Honolulu, Hawaii, USA.

2. Tse T.C.L. (2019). Unmanned Aerial System (UAS) in the Sustainable Built Environment – From a Tertiary Education Perspective in Hong Kong. 7th Annual International Conference on Architecture and Civil Engineering (ACE 2019),

27 – 28 May 019, Singapore. DOI: 10.5176/2301-394X_ACE19.579

(b) RGC funding should have been acknowledged in all activity(ies) / publication(s) / conference(s) papers listed in (a) above. If no acknowledgement has been made in any of the event / publication / paper, please indicate and provide explanations.

N/A

6.5 Research staff trained
(Please provide names and capacities of research staff trained and elaborate on what training has been provided.)

Name	Post	Training	Training provided by
[redacted]	Research Officer	Usage, operation and maintenance of Laser cutting system, CNC router, Multi-material 3D printer, 3D scanners, motion capturing system, laser rangefinder, resistograph, camera system of CNC router, field map survey system and drones	Supplier
[redacted]	Research Officer	Operation of resistograph, GPS device, laser rangefinder and satellite image processing and analyzing software	Supplier
[redacted]	Research Officer	Operation of tree pulling system, resistograph, field map survey system, drones, GPS device, laser rangefinder and satellite image processing and analyzing software	Supplier
[redacted]	Professor	Operation of drone	Supplier
[redacted]	Associate Professor	Operation of 3D scanners and motion capturing system	Research Officer
[redacted]	Associate Professor	Operation of laser rangefinder and tree pulling system	Supplier
[redacted]	Assistant Professor	Operation of laser rangefinder, tree pulling system and field map survey system	Supplier
[redacted]	Assistant Professor	Operation of field map survey system and drones	Supplier
[redacted]	Teaching Fellow	Operation of CNC router, laser cutting system, 3D scanners and motion capturing system	Research Officer
[redacted]	Teaching Fellow	Operation of field map survey system	Supplier
[redacted]	Teaching Fellow	Operation of field map survey system	Supplier
[redacted]	Technician	Usage and operation of camera system of CNC router	Supplier / Research Officer

[redacted]	Teaching Fellow	Operation of drone	Supplier
[redacted]	Teaching Fellow	Operation and usage of multi-material 3D printer	Supplier
[redacted]	Teaching Fellow	Operation and usage of multi-material 3D printer	Supplier
[redacted]	Senior Technician	Usage and operation CNC router, camera system of CNC router, laser cutting system and drones	Supplier / Research Officer
[redacted]	Technician	Usage and operation CNC router and camera system of CNC router	Supplier / Research Officer
[redacted]	Technician	Usage and operation CNC router	Research Officer
[redacted]	Technician	Usage and operation CNC router and camera system of CNC router	Supplier / Research Officer
[redacted]	Technician	Usage and operation CNC router	Research Officer
[redacted]	Technician	Operation of CNC router, laser cutting system, 3D scanners and motion capturing system	Research Officer
[redacted]	Technician	Operation of resistograph	Supplier
[redacted]	Research Assistant	Operation of field map survey system and tree pulling system	Supplier
[redacted]	Research Assistant	Operation of laser rangefinder , field map survey system and tree pulling system	Supplier
[redacted]	Research Assistant	Operation of laser rangefinder , field map survey system and tree pulling system	Supplier
[redacted]	Administration Officer	Operation of laser rangefinder and drones	Supplier / Research Officer

6.6 Specific products
(e.g. patents, software or netware, instruments or equipment, infrastructure developed)

Research Support Centre – the Centre has been operational since Year 1. Its facilities remain available for use by staff and students. Funding was provided by THEi to maintain the facilities and manpower of the Centre after project completion.

Electronic Research Management System "Sophia" – "Sophia" provided cloud storage of the records and documents of all research proposals/projects. It is also an interactive online platform used to process research grant applications and to administer projects. Subscription of "Sophia" was initially funded by another IDS-R project (Ref No.: UGC/IDS25/15) and continued with funding from this project. It is still being used with funding support from THEi.

NVivo licenses (perpetual) – the licenses have been available for use by researchers since Year 1 and will continue to be so on a loan basis after project completion.

SPSS licenses (annual subscription) – subscription continues after project completion with funding support from THEi.

Centre for Sustainable Design and Environment (CSDE): Equipment

All equipment purchased in the project will be used as research infrastructure in future. THEi staff/students can use the equipment in their research projects. All the research equipment items are listed in the Research Equipment Registry and the CSDE's webpage on the THEi website:
https://thei.edu.hk/faculties-and-department/design-and-environment/facilities/equipment

https://thei.edu.hk/research-and-consultancy/researcher-corner/research-equipment-registry

External users from other education institutions or the private sector can also make use of some equipment in their R&D projects.

Course Modules:
Some course modules were developed/update with the concept of "sustainable living", please see part 6.2.

6.7 Other education activities and / or training and development

2 training workshops were organized for public to promote sustainable living in the project period.

14 design competition/exhibitions (see Appendix 12), 3 collaborate design project with external parties (ROUGH, Lenzing HK and Swinburne University of Technology, Appendix 13) were organized by the CSDE to promote the concept of sustainable living.

6.8 Please highlight any deliverables indicated in the project implementation timetable endorsed by RGC, which have not been covered or achieved as per sections 6.1 to 6.7 above, and explain / elaborate.

NIL

6.9 Please elaborate the role of the managing team in coordinating and managing the project.

The IDS project team had quarterly meetings in project period. The Team met to review progress, direct and plan for the implementation of the project, and discuss and resolve any problems encountered. Minutes of the management committee meetings are included in Appendix 17.

Expenditure of the IDS project was spent strictly according to the RGC-approved budget. THEi's Finance Office and Human Resources sections also acted as additional gate-keepers to ensure proper procurement of equipment/services and appointment of staff. Resources were allocated and based on actual needs, and the priority of use of resources was given to PIs of on-going funded research projects.

Three programme leaders in the faculty were appointed as research managers of the three research units of the CSDE. The IDS project team had quarterly meeting to discuss and resolve any problems encountered.

Equipment purchased in SIDL/SIEL were managed by the two Research Officers of the CSDE. They are responsible for record keeping, user training, daily operation and maintenance if needed.

7. Awards And Recognition

7.1 Have any research grants been awarded that are **directly** attributable to the results obtained on this IDS Research Infrastructure Grant project? *(Please provide details)*

Some seed grant projects have been awarded directly attributable to the results obtained on this IDS Research Infrastructure Grant project:

a) "Sustainable Athleisure Sports Bras Design: The Preferences for Aesthetic Attributes in terms of Values and Lifestyles of Generation Y Females in Hong Kong" (SG1718105, $77088) – the project used the 3D body scanner purchased by this project to analysis the body type of the participants and their preference on fashion style.
b) "Improving the Artificial Intelligence on Apparel Size Fitting Prediction under Psychographic Characteristic and 3D Body Measurements Using Artificial Neural Network" (SG1819104, $79,945) – the project used the 3D body scanner purchased by this project to measure and classify the body type of the participants.
c) "Sustainable Knitted Footwear Design for Tai Chi: An Investigation of Knitting Tensions and Foot Shapes under Sensation of Comfort" (SG1819105, $83,985) – the project used the motion capturing system to measure the change in range of motion of participants who wear the new designed sustainable knitted footwear.
d) "Design Exploration of Sustainable Devore with Adoption of Laser Engraving Technology" (SG1819111, $79,920) – This project used the laser cutting system to explore some design of Devore.
e) "A GIS-based Methodology to Investigate Land Use Mix and Air quality in Developing a Smart City of Hong Kong" (SG1819109, $79,950) – the project used the digital maps purchased by the IDS Research Infrastructure Grant project to investigate the the land use and air quality in developing a smart city of Hong Kong

7.2 Other awards and recognitions as a result of this IDS Research Infrastructure Grant project *(Please specify)*

Nil.

8. Other Impacts

8.1 What are the current and expected impacts of the project in terms of its contribution to the local and regional economic and societal well-being? *(e.g., technology transfer, collaboration with external organizations, etc.)*

a) Collaborate with Lenzing for sustainable design project using regenerated fiber TENCEL™ - students from fashion design programme used the regenerated fiber for their knitwear design. The design project enhances students' hand-on experience of using regenerated materials in their design, such experience is expected to be useful when the students are graduated and join the industry. On the other hand, it is expected this collaborate project can enhance local customers' awareness about sustainable materials using in fashion.

b) The use of 3D scanning system in body measurement equip the student from fashion design programme in digital fashion business. This skill is expected to be useful in digitization for fashion business in the future.

c) Collaborate with Towngas for catwalk show, exhibition and workshop in sustainable fashion design. These activities contribute to the local societal in increasing public's awareness of sustainable living style and possibility of waste clothes.

d) Collaborate with Swinburne University of Technology for a design project of sustainable ergonomic chairs with CNC prototypes – group of product design programme's student work in the chair design project.

e) Use of drone becomes part of the regular training for Surveying students. The graduate will contribute to the industry by bring this knowledge into the company they serve.

f) The tree pulling system and field-map system purchased by this project enhance the teaching and research ability of risk measurement of trees. These equipment and graduate from Horticulture and Landscape Management programme are expected to contribute to the society by improving the safety measurement of tree management.

8.2 Others *(Please specify)*

9. Statistics on Research Outputs

	Peer-reviewed Journal Publications	**Conference Papers**	**Scholarly Books, Monographs and Chapters**	**Patents Awarded**	**Other Research Outputs (please specify)**	
No. of outputs arising directly from this project	12	7	3	0	Type	No.
					Various research activities e.g. conferences, exhibitions, workshops, seminars, taster programs etc.	112

10. Sustainability of The IDS Research Infrastructure Grant

10.1 Whether there are new ideas evolved **directly** from the project?

- Usage of drones in surveying included in the programme modules
- Sustainable design concepts fashion and product design students' research projects
- Use of 3D scanner in body size measurement
- Use of CNC router and laser cutting system to process sustainable material / implement of sustainable design concept
- Use of multi-material 3D printer to produce parts which use for upcycling design of waste materials
- Usage of tree pulling system and field-map system for risk management trees

10.2 Whether there are new projects evolved **directly** from the project?

- 6 seed grant projects were evolved with the support of equipment purchased from the project, includes drones, digital maps, 3D body scanner, laser cutting system and motion capturing system.

10.3 Whether there are new collaborations developed **directly** from the project?

The institute developed collaborative projects with Towngas, Hong Kong Women Workers' Association, Lee Tung Avenue, Caritas Community Centre, Hong Kong Printing Media Industry Workers Union, Winning Textile, Mission Hills China, Lenzing and Swinburne University of Technology in the project period (see Appendices 12 and 13).

These collaborations are either design projects with sustainable materials or exhibitions in the concept of sustainable living. By collaborating with the industrial and various organization, the institute promotes the importance of sustainable living style to the society and industry.

10.4 Please give details on how much money and from which sources has been obtained for the specific purpose of continuing the work started under this IDS Research Infrastructure Grant project.

Research Support Centre – funding support for the continued operation of the Centre including facility maintenance and two supporting staff is provided by THEi.

Centre for Sustainable Design and Environment (CSDE), currently under the management of the Faculty of Design of Environment (FDE), will continuously be managed by FDE in the future.

Equipment purchased by the project will be managed by various academic programmes. Research officers hired in the project had transferred their experience and knowledge to technicians and academic staff (see part 6.5) to ensure the equipment will continuously be used in research activities in the future.

In the reporting period, 15 academic staff received financial support by the RGC to attend academic conferences and present their research outcome. In the future, academic staff can apply for the institute's staff development programme to attend academic conference.

The project supports the arrangement of conference and seminars in the theme of sustainable living. During the project period, 4 IIDS proposals were funded with the total amount of about 1.65M. The institute will continuously develop research proposals to organize conference and seminars in the future.

11. Public Access Of Completion Report

(Please specify the information, if any, that cannot be provided for public access and give the reasons.)

Information that Cannot Be Provided for Public Access	**Reasons**
Nil	

RGC Ref. No.: UGC/IDS25/16
(please insert ref. above)

INSTITUTIONAL DEVELOPMENT SCHEME (IDS)
RESEARCH INFRASTRUCTURE GRANT

Summary of Completion Report
(Please list all the stages since project inception)

Project Title: Research on Sustainable Living: Phase Two of the Capacity Building Plan

Stage Completed	Period	[redacted]	Milestones	
	(Month / Year) to (Month / Year)		Deliverables to be Achieved[2] (Please summarize in three bullet points where details should be left to the report proper)	% of Each Deliverable Achieved[3]
1	April 2017 – March 2018		1. Set up a Research Support Centre 2. Set up a Research Centre for Sustainable Design and Environment 3. To purchase and install the equipment and database	1. 100% 2. 100% 3. 100%
2	April 2018 – March 2019		1. Research Support Centre started to provide services and organize research support activities. 2. Research proposals development for external grants 3. Develop knowledge exchange programmes and research support activities	1. 100% 2. 100% 3. 100%
3	April 2019 – Sep 2020		1. To submit academic papers to referred journals 2. Research proposals development for external grants 3. To organize an international conference/exhibition to deliver the research output	1. 100% 2. 100% 3. 100%

Stage Completed	Period	[redacted]	Milestones	
	(Month / Year) to (Month / Year)		Deliverables to be Achieved[2] (Please summarize in three bullet points where details should be left to the report proper)	% of Each Deliverable Achieved[3]
	Total to-date:			

Note: [1] Justifications for significant under-spending or over-spending (≥ ±10%) should be given in **section 5.1** of the completion report.
[2] The key milestones to be achieved by the project within the respective stage as indicated in the approved implementation timetable.
[3] Justifications for significant slower rate of progress compared with the approved implementation timetable should be provided in detail in **section 4** of the completion report.