THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning
(for Faculties and the Office of University General Education)

Project title:	**Virtual Teaching and Learning of General Education under the New Normal**
Principal supervisor and unit:	**Professor LEE Hun Tak Thomas, Office of University General Education**

Brief description of the project

Two campus-wide surveys of teachers and students of General Education (GE) courses, as well as a small-sample focus-group study of GE teachers, have been completed. The results of the two campus-wide surveys have provided a general picture of and insights into (i) GE teachers' use of VTL in 2020-21 and their perception of its effectiveness, and (ii) student perception of the use of VTL and its effectiveness in GE courses offered in 2020-21. The focus-group interviews with 26 teachers have confirmed and enriched the findings of the two surveys.

Activities and/or outcomes

Two survey tools on the use and perception of VTL have been constructed to collect data from teachers and students. A preliminary report and a report on the methodologies and major findings of the two surveys have been completed.

Impact and results achieved

Of the 8 VTL tools we surveyed, the ones most frequently used by teachers were Video Conferencing Systems (e.g. ZOOM), Learning Management Systems (e.g. Blackboard) and Audiovisual Materials. Students used VTL significantly less than teachers for all the VTL tools surveyed. Variation was observed in teachers' perception of VTL tools, with teachers in University GE Area-B (Nature, Science and Technology) and "In Dialogue with Nature" being highly skeptical of using Learning Management Systems (e.g. Blackboard) and Student Response Systems (e.g. uReply) in the classroom. Significant positive correlations were found between the frequency of use of Student Response Systems, Learning Management Systems, and the CTE ratings for all of the eight questions bearing on student feedback on online teaching, in-class participation and communication, and satisfaction with the teacher. The use of Audiovisual Materials in VTL may not improve students' perception of pedagogical effectiveness. Students generally do not prefer VTL, despite its advantages in information access. In the VTL setting, they receive less clear and effective instruction, and are more susceptible to distraction and disturbances. Communication between students and teachers, as well as interaction between students, suffered a sharp and visible deterioration, in both quantity and quality.

Evaluation

The results of the surveys, based on a sizable data sample, reveal clear statistical patterns. A preliminary analysis of the results of the focus-group interviews has been conducted, though the full analysis remains to be completed.

Dissemination, diffusion and sharing of good practices

Two oral presentations have been given, one to teachers of the GE Foundation Programme in 2022, and another at the annual meeting of University General Education Alliance of China held in Chongqing in April 2023.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning
(for Faculties and the Office of University General Education)

Project title:	**Bringing Virtual Technology into Humanities Education: A Reflective Practice**
Principal supervisor and unit:	**Professor KWONG Ho Yee Connie, Department of Chinese Language and Literature**

Brief description of the project

This project aims at exploring the best practices of the applications of virtual technology. Three pilot studies in three different areas – art creation and curation, literary studies and virtual writing support – were carried out.

Activities and/or outcomes

In Pilot Study 1, students of two courses were given the opportunity to utilize mixed reality and telepresence technology to create and curate art. As part of their final projects, the students had to create artwork using MR technologies, as well as curating an online exhibition.

In Pilot Study 2, new features were added to the "CUHK Literary Map" to further improve its virtual teaching capabilities.

In Pilot Study 3, an eLearning platform has been built for around 130 students from the Department of Sports Science and Physical Education to support their preparation of the research proposal/report.

Impact and results achieved

Through this VTL project, students had the chance to evaluate physical restrictions, use their limitless imagination to come up with novel ways to convey stories, produce and display artwork, be motivated to write literary works, and to gain virtual support for proposal writing.

Evaluation

The pilot studies were well-received by the students involved. The students found the two courses in pilot study 1 interesting and stimulating. Student users of pilot study 3 generally evaluated the eLearning platform positively.

Dissemination, diffusion and sharing of good practices

Two webinars about virtual and reality were organised in 2021 and 2022 to convey experiences and knowledge gained with other educators. In addition, a book chapter about the design concept of the CUHK Literary Map application was published. Presentation about the eLearning platform will be delivered in conferences.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning
(for Faculties and the Office of University General Education)

Project title:	**Review, Evaluate, and Continuous Improvement: Deliver High-quality Virtual Education at Faculty of Business Administration**
Principal supervisors and units:	**Professor ZHANG Meng, Department of Marketing** **Dr. TIAN Jie Jenny, School of Hotel and Tourism Management** **Dr. YUEN Chi Lok Andrew, Department of Decisions, Operations and Technology Dr. KU Kei Tat Fred, Department of Decisions, Operations and Technology**

Brief description of the project

The project includes three initiatives. Initiative 1 is a multi-method study on the VTL practices adopted by the CUHK Faculty of Business Administration (FBA) teachers during the pandemic and VTL effectiveness perceived by FBA teachers and students. Initiative 2 is a special funding scheme for VTL innovations in business courses. Initiative 3 involves actions to share these results within and beyond the CUHK community.

Activities and/or outcomes

We have conducted focus group interviews and online surveys of FBA faculty members and students regarding their VTL experiences and perceptions. We have also funded seven course-level projects, which have generated VTL contents in various formats (e.g., animated videos, AI-analyzed videos, and virtual reality games). These VTL contents can be used in multiple courses and teaching modes, and have been well-received by students.

Impact and results achieved

The results of this project will lead to a better understanding of VTL, as well as best-practice recommendations, for FBA teachers. In addition, the results generated in Initiative 2 have benefited, and will continue to benefit students in multiple courses.

Evaluation

The VTL contents created in this project have been well received by the students and by the education community in general.

Dissemination, diffusion and sharing of good practices

The participating faculty members have shared their work at various workshops, seminars, conferences, teaching events, and other publicly accessible platforms.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning
(for Faculties and the Office of University General Education)

Project title:	**Developing a Faculty-wide Video-based Pedagogy and Assessment Framework to Enhance Reflective Video-Engagement: Integration with the University-wide Learning Management System for Virtual Teaching and Learning**
Principal supervisor and unit:	**Professor NG Oi Lam, Department of Curriculum and Instruction**

Brief description of the project

Video resources portray dynamic real-life events that promote authentic learning. In addition, it could also record lectures about sophisticated concepts with illustrations. Video-based learning is thus becoming widely accepted by today's youth as a source of information. In particular, research has proven that the use of videos is a viable method to engage teacher candidates in reflective practice so as to improve their professional skills. Despite the potential benefits of using videos in teacher education programmes, there remains further pedagogical and technological developments to enhance students' video engagement, especially in virtual teaching and learning (VTL) contexts.

Chi et al. (2018) proposed a taxonomy of learning activities that moves through the ladder of passive, active, constructive and interactive, and the research indicates that while the higher levels activities (constructive, interactive) produce better learning outcomes, most lessons are confined to the lower level activities. Given today's needs for learner self-direction and self-management for life-long learning, this project builds on Chi et al.'s (2018) ICAP framework with reflection for the learning activities as consolidation for knowledge learned and learning processes ensued. The RICAP framework is thus a technological pedagogical video-based framework that comprises of:

- **P**assive watching;
- **A**ctive noticing and annotating;
- **C**onstructive articulating of theoretical significance,
- **I**nteractive negotiation of resolution;
- **R**eflective consolidation of learning.

The RICAP framework draws on video-based technology that includes annotation and constructive and collaborative knowledge building of the annotated moments. The project objectives are to enhance students' video engagement through active meaning-making:

1. to integrate a common pedagogical framework to promote active video-based VTL in the Faculty, so as to highlight students' professional skills across different programmes;
2. to utilize a video-engagement portal with University-wide Learning Management System (LMS) in blended learning contexts to facilitate individual and collective reflective practice, and to utilize learning analytics (viewing time, numbers of annotation, quality of constructive comments and discussions) generated in LMS to inform VTL best practice;
3. to implement coherent strategies for assessing students' video-engagement in terms of the quality of video-based reflections and peer discussions in VTL contexts.

The RICAP framework will be used to design a series of VTL lessons covering six undergraduate and one postgraduate diploma programmes, and the effectiveness of the lessons will be evaluated to inform future VTL best practices in the Faculty and beyond. This project is aligned with University's eLearning strategy, for which VTL will play an important role. The developed video modules, pedagogical and assessment frameworks are expected to impact teaching and learning by promoting active, multimedia learning in and

out-of-class.

Activities and/or outcomes

1) New design of pedagogical sequence and assessment:
   - 7 programmes revisited; new design adopted by 15 courses
2) Adoption of mixed-mode teaching:
   - 15 high-quality mixed-mode courses developed; 300 students benefitted
3) Staff development activities conducted:
   - 2 workshops/activities attended by 30 teachers from 4 different departments
4) New VTL strategies, pedagogies and platforms in coursework:
   - 6 undergraduate programmes (100 students) and 1 postgraduate diploma programme (200 students) adopted
5) Experience sharing session conducted with 50 teachers and students attended
6) Website for showcasing project summary and delivering project outcomes
7) Presentation in 2 conferences

Impact and results achieved

No.	Key activities/ deliverables/ outcomes	Key performance indicators (KPIs)	Timeline
1.	New design of pedagogical sequence	7 programmes revisited; new design adopted by 15 courses: BMED 3021, BMED 3091, CLED 4630, EDUC 3140, ELED 2810, ELED 4740, LSED 3130, PGDE 5311A, PGDE 5311K, PGDE 5311H, PGDP 5004, PGDE 5009, PGDP 5109, SPED 3440, SPED 3410	July to Dec 2021
2.	New design of assessment		Jan to Mar 2022
3.	Adoption of mixed-mode teaching	15 high-quality mixed-mode courses developed; 300 students benefitted	Jan to Dec 2022
4.	Staff development activities conducted	2 workshops/activities attended by 30 teachers	Dec 2021; May 2022
5.	Exploration and integration of new VTL strategies, pedagogies, platforms and facilities	New VTL strategies, pedagogies and portals in coursework for 6 UG programmes (100 students) and 1 PG diploma programme (200 students)	Phase 1: Jul 2021 to Dec 2022 Phase 2: Jan to Jun 2023
6.	Experience sharing sessions	1 sharing session conducted with 50 teachers and students attended	May 2023
7.	Project website	1 website showcasing project summary and delivering project outcomes	May 2023
8.	Conference presentation	Presentation in 2 conferences	July 2022; Apr 2023

Evaluation

The project team adopted multiple methods to evaluate the project impact. The methods included:

1. **Student assignments**: assessing students' reflection assignments to evaluate how they comprehended or applied course learning.
2. **Learning analytics**: counting the number and assessing the quality of video-annotation students made individually and collectively.
3. **Online survey evaluation**: online survey to gauge students' feedback and comments about their learning experience.
4. **Group evaluation**: ongoing semi-structured discussions with course instructors and students to gauge their feedback and comments about their teaching and learning experience.

Dissemination, diffusion and sharing of good practices

Sharing good practices and activities:

- The developed video modules, video-engagement pedagogical framework with lesson templates, and assessment rubrics were posted on a website for public access and showcase.
- The project team presented the deliverables and best practices within the University (at CUHK's Teaching and Learning Expos) and outside the University through conference presentation(s).
- A sharing of the project experience and outcomes was organized near project completion.

Sustainability of the project for long-lasting impact:
Given the guidance and scaffold support from the project team, the course teachers developed and sustained professional knowledge on the proposed pedagogical and assessment frameworks. The ongoing discussions with course teachers as well as sharing sessions made lasting changes in teaching staff through applying the knowledge and experiences gained in their future teaching. During the first set of implementations of the project, the project team ensured that course teachers were able to master the technical aspects of the designed pedagogical sequence and their proper implementation. Then, subsequent meetings were held to share best practices, which have high potential to remain part of the curriculum. This provided clear evidence for project sustainability. In addition, the website as a deliverable also contributed to the sustainability of the project, as well as inter- and cross-faculty knowledge exchange after the completion of the project. The good practices from the project were documented and thus sustained.

Applying project outcomes to other programmes and courses:
The project deliverables cover the broad topic of improving one's professional and reflective practice, which is fully compatible for adaptation in courses within and outside of the Faculty of Education. Within the Faculty of Education, those courses consisting of components related to micro-teaching, lesson planning, and lesson implementation can make use of demonstration videos (made by course teachers), student-made videos for practicing and applying certain concepts learned, and exemplary videos as chosen by the course teachers to facilitate video-based reflection. In addition, those courses from outside the Faculty of Education that focus on attending to fine details (e.g. lab demonstrations, human interactions, and step-by-step instructions) can apply the developed video-based pedagogy and assessment strategies to facilitate students' reflective practices in order to enhance student learning, as well as to generate in-class or out-of-class discussions upon presenting a certain theory or practice.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning
(for Faculties and the Office of University General Education)

Project title:	**Innovative E-Learning Platforms and Tools for Effective Integration of VTL in Engineering Education**
Principal supervisor and unit:	**Professor LEE Tan, Department of Electronic Engineering**

Brief description of the project

This project comprises three new initiatives toward effective implementation of virtual teaching and learning (VTL) at the Faculty of Engineering (FoE), CUHK. Colleagues across different departments are involved. The project outcomes are expected to impact both engineering and general education courses.

Robot-Assisted Remote Laboratory Platform

Two different systems were developed for the learning of engineering through robots. The first system is for Learning of electronics through remote robot assembly. It allows students to remotely control a robot to assemble electronics circuits. The second system aims at applications of robotics through virtual and mixed-reality environments. It allows for diverse simulated and realistic environments beyond electronics.

Intelligent Cloud Teacher

The main objective of this project is to develop intelligent chat agent for answering questions from students in the learning of computer programming and to provide individualized instruction and guidance for students. Mobile application of intelligent conversational agent was developed and tested in three programming courses.

Online Exam Monitoring System

This project is about developing and enhancing an online exam monitoring platform called iExam. The iExam system can be used to assist online examination invigilation via real-time video analysis and facilitate comprehensive post-exam data analysis of the examination process.

Activities and/or outcomes

Project 1: Robot-Assisted Remote Laboratory Platform

(a) Completion of a robot-assisted remote laboratory platform for engineering courses;
(b) Deploy and test the robot and environments in teaching of engineering courses;
(c) Three talks and one workshop organized to share the project outcomes.

Project 2: Intelligent Cloud Teacher

(a) Developed a mobile application of the intelligent conversational agent for three undergraduate courses;
(b) Performed data analytics of student questions to support individualized instructions to students;
(c) Delivered four seminars in other local universities and education technology workshops;
(d) Six presentations in local and international conferences.

Project 3: Online Exam Monitoring System

(a) Developed the iExam system and created a free website (https://vprlab.github.io/iexam/) to allow invigilators to use the system with Zoom;
(b) System source codes (https://vprlab.github.io/iexam/) and a technical report (https://arxiv.org/pdf/2206.13356.pdf) are made available for public access.
(c) Delivered an invited talk at the Teaching and Learning Innovation Expo (slides available at (https://daoyuan14.github.io/slides/Expo21_iExam.pdf)

Impact and results achieved

(a) Collaboration with overseas University Cardiff Metropolitan University

(b) Awards:

- Gold Poster Award in 2021 CUHK Teaching and Learning Expo
- Gold Award in Technology Innovation, in 16th eLearning Forum Asia, 2021.
- Gold Award in Educational Technology Innovation, CUHK Teaching and Learning Innovation Expo, 2022.
- Best Oral Presentation Award, International Conference on Education and Training Technologies, 2023.
- Best Presentation Award, The International Conference on Modern Educational Technology, 2023.

Evaluation

Project 1: Robot-Assisted Remote Laboratory Platform

Qualitative feedback were collected through interviews from the students of one undergraduate and one postgraduate courses.

Project 2: Intelligent Cloud Teacher

Evaluation surveys were carried out students' learning experience and user experience in three undergraduate courses. Focus-group interviews were carried out in the same courses.

Project 3: Online Exam Monitoring System

Field tests were carried out in two Engineering courses and feedback were collected from system users.

Dissemination, diffusion and sharing of good practices

Project 1: Robot-Assisted Remote Laboratory Platform

- 1 faculty-level workshop, 2 online talks, 1 in-person talk
- 1 presentation award in CUHK Teaching and Learning Expo

Project 2: Intelligent Cloud Teacher

2 seminars, 2 workshops, and 6 presentations in 6 local and international conferences.

Project 3: Online Exam Monitoring System

- Website at https://vprlab.github.io/iexam/ and openly accessed source codes on GitHub
- Presentation at CUHK Teaching and Learning Innovation Expo
- Technical report publicly accessible on arXiv

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning
(for Faculties and the Office of University General Education)

Project title: **Directions in Virtual Teaching and Learning the Law**

Principal supervisor and unit: **Professor GALLAGHER Steven Brian, Faculty of Law**

Brief description of the project

The project aims to facilitate the implementation of the Strategic Plan and the further development and exploration of VTL in CUHK in terms of the categories as specified by the UGC in Part I 4(a), with clear documentation of the processes and outcomes.

Activities and/or outcomes

We organized one two-day online legal education conference and six Teaching and Learning Seminars. A mix of international and local participants comprising teachers, practitioners and students attended these events. Furthermore, the empirical research generated valuable information relevant to the strategic development of VTL. The findings were presented at a Teaching and Learning Seminar and at Teaching and Learning Innovation Expo 2022. Each presentation received valuable questions and feedback from the audience.

Impact and results achieved

The empirical research conducted for this project collected law students' and teachers' views on VTL. The findings informed what aspects of online teaching students find useful for learning and teachers' concerns about online teaching. This information is vital for the strategic development of VTL as it balances the views of students and teachers.

Evaluation

This research project has achieved its goals. The survey findings enabled the Faculty to build on its existing expertise in VTL and develop professional best practices for VTL. The findings provided relevant information regarding students' learning needs and teachers' concerns over VTL. The information is useful for developing the Faculty's VTL strategy.

Dissemination, diffusion and sharing of good practices

Workshops/seminars and experience-sharing sessions will be organized to disseminate the findings of this research project. Furthermore, the Faculty website should be used for sharing good practices.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning
(for Faculties and the Office of University General Education)

Project title:	**Virtual and Remote Engagement with Interdisciplinary Training among Data-Science, Engineering and Digital Health for Medical Students**
Principal supervisor and unit:	**Professor TSOI Kam Fai Kelvin, The Jockey Club School of Public Health and Primary Care**

Brief description of the project

In response to the outbreak of pandemic, modification of the courses has thus been made, the courses were changed to online lectures with educational videos for Public Health students. Basic architecture of digital health from digital devices and data platforms, computing and data science and artificial intelligence have also been provided to the students. Physicians and CEO were invited as guest speakers in different lectures, together with Professor Kelvin Tsoi, Principal Supervisor of the project, to share their experiences and expertise with the students.

Activities and/or outcomes

Two staff have been employed for this project after resuming normal in Apr 2022, though the start of the video preparation was behind the planned schedule, 20 educational videos have been completed on time. Three online courses have been conducted with the use of educational videos.

Impact and results achieved

Three courses have been conducted online with the use of educational videos. For the course EPID6005 (Digital Epidemiology), several physicians and a CEO were invited as guest speakers in different lectures, together with Professor Kelvin Tsoi, to share their experience and expertise with the students. The results of the students reflected that the virtual lessons could bring positive and good performance for the students compared with face-to-face lectures as control group.

Evaluation

The evaluation from students of the three online courses is 5.42/6 on average. For the online course EPID6005 (Digital Epidemiology), its evaluation is 5.75/6.

Dissemination, diffusion and sharing of good practices

The results of the students of virtual lessons reflected that the virtual lessons could bring positive and good performance for the students. It is believed that if the flipped classrooms could be delivered, the experience of the students may be even better.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning
(for Faculties and the Office of University General Education)

Project title:	**The Roadmap of Virtual Teaching and Learning Development in the Faculty of Science**
Principal supervisor and unit:	**Professor KWAN Kin Ming, School of Life Sciences**

Brief description of the project

With the continued prevalence of online education, CUHK Faculty of Science (CUHK Science), representing a wide range of disciplines of sciences housed under the same faculty, including a number of laboratory sciences for which hands-on learning in a laboratory is a fundamental part of a student's training, led the current project which aimed to facilitate and provide guidance of virtual teaching and learning (VTL) development and integration at CUHK Science by establishing a cross-disciplinary task force from all teaching units of the Faculty, steering and promoting VTL in three phases at different levels.

Activities and/or outcomes

Phase I: Identification of gaps and needs of different stakeholders
- Formed cross-disciplinary task force
- Conducted online survey of all relevant stakeholders at the Faculty

Phase II: Coordination and implementation
- Trainings & workshops to equip teachers and supporting staff to meet identified challenges
- Acquire communal equipment and software repository to support material creation needs
- Revisit undergraduate courses and programmes at the Faculty to determine current status of VTL implementation and integration, current challenges (and additional needs), and future plans
- Conduct pilot projects to encourage creative innovations in enhancing students' learning experience with the help of VTL

Phase III: Evaluation and sharing
- IT infrastructure interview and review
- Consolidate learnings from project and distill into suggestions for future VTL development
- Organise sharing session to encourage meaningful exchange of experiences and ideas, and stimulate further discussion and adaptation of pilot project ideas for the benefit of teachers and students

Impact and results achieved

Courses spanning all undergraduate Science programmes were revisited to consider the current and future use of VTL in the courses. The exercise helped to focus teachers' consideration of course design and how best to help students learn the course contents, and as a result of the review, 6% of courses revisited were reported to introduce VTL into its course materials over the next three years, which represents a 22% jump in undergraduate science course once VTL integration is completed.

Following the results of the Needs Analysis (conducted between 5-24 Jan 2022, during online teaching mode), students' and teachers' input informed the provision of trainings & workshops in Phase II of the project. Participants of the sessions appreciated the additional support provided, and enjoyed gaining new skills in producing VTL materials in video format.

Evaluation

The response for the "Master the Virtual Classroom" workshop was mixed, as some felt that they wanted a longer workshop with more hands-on opportunities to practise what was taught, while others thought that an even more in-depth, perhaps one-on-one observation of online class teaching would be more pertinent in

identifying individual-level areas of improvement and provide personalised recommendations. As for the VTL Material Creation and Production Masterclass (3 lessons + 3 tutorials), feedback was overall positive, as it not only offered a skilled teacher to teach basic skills in video shooting and editing, but also helped staff get acquainted with the Faculty's communal equipment. The potential benefits of the workshop reached beyond just the production of instructional materials, but also into other aspects that would require short videos to convey ideas.

For pilot projects, all students felt that they benefited from the experience, and hoped for continued innovations to make learning more engaging. Student helpers who were recruited to help in the pilot projects expressed their gratefulness for having the opportunity to work on their projects, as it gave them the opportunity to try new things, while becoming more familiar with the course contents. Teachers appreciated the support received to conduct pilot projects, as the Task Force was very receptive to trying out different new ideas. Five projects conducted sharings at the event "Community of Practice: Virtual Teaching and Learning in the Sciences" held on 29 June 2023. Among the responses collected from the participants of the session, 75% said that at least one of the sharings gave them a new idea about VTL, while a majority of the participants expressed that they found the sharing session helpful in stimulating new ideas for VTL in the future.

Dissemination, diffusion and sharing of good practices

Dissemination Occasion	**Date / Location of the occasion**
Gave a report at the CUHK Science Faculty All Staff Meeting	9 June 2022; Hybrid mode
Gave a report at the Science Faculty Executive Committee	21 September 2022; CUHK campus
Organised and hosted "Community of Practice: Virtual Teaching and Learning in the Sciences" for all CUHK Science teaching and supporting staff	29 June 2023; via Zoom
Dedicated website about current project	http://www.sci.cuhk.edu.hk/en-gb/academic/teaching/vtl

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning
(for Faculties and the Office of University General Education)

Project title:	**Promoting Blended Learning in Social Science**
Principal supervisors and units:	**Professor CHEUNG Wai Ting Nicole, Department of Sociology** **Dr. MOK Kai Chung Wallace, Department of Economics**

Brief description of the project

The project consists of (1) in-depth pedagogical research in VTL and (2) production of catalogue and guide of recent education technologies relevant to social science.

Activities and/or outcomes

The VTL pedagogical research was conducted by a survey of 727 undergraduate and postgraduate students and 122 teachers from diverse social science departments as well as focus group qualitative discussions with students and teachers. We also reviewed the latest education technologies from the viewpoint of education programs in social science, incubated a team of blended learning consultants, and designed an online interactive platform for the introduction of selected software and practices to teachers.

Impact and results achieved

The VTL pedagogical research results provide the teaching units of social science a broad view of the recent VTL situation and readiness for further investment in blended learning. The software catalogue, video tutorials and interactive website produced by us are practical guidance on suitable technology tools and their effective use, and would help teachers explore new VTL strategies.

Evaluation

Teachers experimented with the recommended software in 10 courses enrolled by 576 students, followed by an evaluation survey.

Dissemination, diffusion and sharing of good practices

The VTL pedagogical research results are summarized in the "Virtual Teaching and Learning Research Report", which is shared with all the teaching units within the Faculty of Social Science. The interactive website, which includes the software catalogue and video tutorials of our recommended software, is hosted by the Faculty and made available to the Faculty teachers.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**"Bullet Screen" for Virtual Teaching and Learning: An Innovation for Online Collaborative Video Analysis**
Principal supervisor and unit:	**Professor TAN Jia, Department of Cultural and Religious Studies**

Brief description of the project

Bullet screen, or danmu, is a popular function in Asian video sharing websites where users can submit, view, and add textual commentaries flying in and out of screen like bullets while watching the videos online. Collaborating with the Information Technology Services Centre (ITSC) at CUHK, this project develops and implements an online tool for video analysis as a virtual teaching and learning activity using the innovative function of "bullet screen". The bullet screen tool is designed to optimize collaborative online learning with video by encouraging interactions among students and between students and teacher.

Activities and/or outcomes

This project has developed the CUHK damnu exercise tool as a learning tool to be used for class videos, in collaboration with ITSC. The danmu exercise has been implemented in three different courses, reaching 170 students in total.

Impact and results achieved

Qualitative feedback from students also shows that the good aspects of learning video analysis using the danmu exercise includes it is fun and engaging, easy to use, convenient for collecting feedback and sharing opinions. Students also think that the tool provides improved attention to video details and the anonymous nature of the tool allows students to participate more actively.

Evaluation

Student feedback on the Danmu learning tool shows that 59.6% of the students agree that the Danmu exercise is effective and 65.4% of the students are satisfied with the Danmu exercise.

Dissemination, diffusion and sharing of good practices

The Principal Supervisor has given three presentations and one workshop to disseminate the good practices, reaching about 150 CUHK teachers and staffs.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Virtual Behavioral Research for Humanities and Social Sciences**
Principal supervisor and unit:	**Professor CAI Zhenguang Garry, Department of Linguistics and Modern Languages**

Brief description of the project

In response to the covid pandemic, Virtual Behavioral Research (VBR) is to maintain students' engagement in research activities and to address their pressing research needs. It introduced students to virtual platforms for experimental implementation (Qualtrics and Gorilla) and for participant recruitment (Prolific and MTurk). The course consisted of 18 lectures and tutorials. The course was carried out between 01/09/2021 to 31/08/2022.

Activities and/or outcomes

The course consisted of 18 lectures and tutorials covering platforms and techniques for doing virtual behavioural research (e.g., Qualtrics, Gorilla, Prolific). See course outlie below. For course materials, please visit https://osf.io/948jf/.

Course outline

Session	Content
Term 1	
Week 1	Qualtrics: Question type
Week 2	Qualtrics: Tutorial
Week 3	Qualtrics: Displaying pictures and audios
Week 4	Qualtrics: Tutorial
Week 5	Qualtrics: Advance techniques
Week 6	Qualtrics: Prolific, MTurk, tutorial
Week 7	Gorilla: Reaction time
Week 8	Gorilla: Tutorial
Week 9	Gorilla: Input response
Week 10	Gorilla: Tutorial
Week 11	Gorilla: Mouse tracking and eye tracking
Week 12	Gorilla: Data analysis and tutorial
Term 2	
Week 1	Qualtrics: Demo and help session 1
Week 2	Qualtrics: Demo and help session 2
Week 3	Qualtrics: Demo and help session 3
Week 4	Gorilla: Demo and help session 1
Week 5	Gorilla: Demo and help session 2
Week 6	Gorilla: Demo and help session 3

Impact and results achieved

It was attended in person (mainly) by about 30 students (mostly MA and PhD students from the Faculty of Arts).

Evaluation

In a feedback survey, students rated their satisfaction with the course 6 out of 7 (7 being most satisfactory)

(see https://osf.io/download/79d3m/). They felt that the course was very useful and that they would use the learned techniques if they were to conduct virtual behavioural research.

Dissemination, diffusion and sharing of good practices

We have maintained a social media (Wehchat) group where we discuss virtual research with the attendees. The teaching materials are hosted online for public use (https://osf.io/948jf/); note that we did not make recordings of the lectures/tutorials due to privacy concerns. To further promote virtual behavioural research, the Principal Supervisor gave a shortened version of VBR at the annual conference of the Chinese Psycholinguistics Association, which was held at Zhejiang University (virtually) on 10 June 2022 (https://mp.weixin.qq.com/s/lHWM4Xuvm56HfsFdzWh3Mg).

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Revamping the Assessment of HKSL I and II based on the Guidelines of the Common European Framework of Reference for Languages (CEFR)**
Principal supervisor and unit:	**Professor SZE Yim Binh Felix, Department of Linguistics and Modern Languages**

Brief description of the project

The project aims at developing new sets of online assessments to replace the existing paper-and-pen assessment tasks. In total, 22 sets of formative and summative assessments on comprehension were produced for assessing students of HKSL I and HKSL II in 2021-22. The online assessment items including 132 video clips of questions with answer choices (for MC questions) were archived on Panopto, Blackboard, and an e-learning HKSL platform for use in the academic year 2021-22 and onwards.

Activities and/or outcomes

The team reviewed the non-virtual assessment items used in previous academic years to identify materials for adoption with minor changes and confirmed the list of materials to be developed in this project in Aug 2021. A set of new test materials was produced and tested by Dec 2021. After an interim review, the full set of test materials was completed in Jun 2022. An overall review was conducted in Jul 2022 where feedback from students tested with the new assessment materials was collected via a questionnaire survey.

Impact and results achieved

Students enrolled in HKSL I and HKSL II in Term 1, Term 2 & Summer Term, 2021-22 were satisfied with the new format of formative and summative assessments. Students enrolled in higher-level HKSL courses (i.e., HKSL III to VI) also have access to the new sets of formative assessment materials via an e-learning HKSL platform (http://www.cslds.org/hksl_book/) for further practice. Around 600 students will be benefited in each academic year. The team has started a new project in the new triennium to revamp the assessments for HKSL III to VI.

Evaluation

Full adoption of online materials and Blackboard for assessment tasks allow the teaching team to identify more effectively question items that require reviews for their level of difficulty. The virtual assessment can be effectively used in online mode, mixed mode, and face-to-face teaching in the long run. While face-to-face interactions are indispensable for providing students with authentic experiences in signed communication and immediate feedback, a rich pool of language resources should be developed particularly for learning HKSL since online resources are scattered and limited.

Dissemination, diffusion and sharing of good practices

The experience in enhancing student learning experience was shared at the 28th Annual Conference of the International Association of Chinese Linguistics (IACL-28), 20-22 May 2022. Among the participants, are educators and researchers working on sign language curriculum development with reference to CEFR. The conference is, therefore, a good venue to demonstrate a model for reference.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**English & Chinese Bilingual Corpus of Practical Translation**
Principal supervisor and unit:	**Dr. LAW Wai On, Department of Translation**

Brief description of the project

This is the first English/Chinese bilingual corpus with Public Relations (news releases, company profiles, mission statements, social responsibility reports) and business (product literature, tourist, advertisements) texts for learning purposes in the world. A total of about 102,000 words are handled, amounting to 52 pages of bilingual texts. All the texts are annotated. The platform is open to the public, and accessible to teachers and students all over the Greater China region anytime, anywhere, individually or collectively.

Activities and/or outcomes

A total of about 102,000 words are handled, amounting to 52 pages of bilingual texts. All the texts are annotated, highlighting the proper nouns, the cultural items, the keywords, the sentence structure, and rhetorical devices. Learners can choose to read a monolingual text, or a bilingual text, hover on certain proper nouns, expressions or sentences to learn about the translation, and analyse the translation strategies.

Impact and results achieved

The corpus has been useful in promoting a task-based approach to translator training. The use of the corpus has helped students enhance their translation competence, in particular, their instrumental competence, and their autonomous learning.

Evaluation

We have tested the use of the corpus by inviting students to answer survey questions. The students agree that using this Corpus can help them translate better, feel more confident about a translation solution, learn new ways of finding information to solve translation problems, and feel more in control of their own learning.

Dissemination, diffusion and sharing of good practices

The corpus can be used by teachers, students, and the public. We have shared our good practice of VTL in the retreat of the Department, made a presentation at the *Community of Practice Symposium of Education Innovation and Technology 2022* organized by the Centre for Learning Enhancement And Research (CLEAR), and will be presenting our research findings at the 5th Conference of the Association of Programmes in Translation and Interpreting Studies to be held in November 2023, at Queen's University Belfast.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Intervarsity Collaboration in Co-Developing VTL Materials to Promote Solving Social Issues from a Business Perspective**
Principal supervisor and unit:	**Dr. KU Kei Tat Fred, Department of Decisions, Operations and Technology**

Brief description of the project

The project, spanning from October 2021 to June 2023, aimed to enhance the learning and teaching experience with self-contained online courses. The objectives were to improve students' understanding of social issues, equip them with analytical tools to analyze these issues, and support faculty members leading projects or practicum of related themes.

Activities and/or outcomes

Activities included a live seminar, six workshops on Responsible Business and ESG, creation of six ESG micro-modules, a study tour to Nagoya, Japan, and partnerships with over five institutions or professional practitioners.

Impact and results achieved

This project significantly advanced VTL strategy by developing interactive ESG micro-modules, which were well-received and can serve as pre-training materials in practicum. The success of the online co-teaching model fostered international collaboration opportunities, enhancing the educational experience. Students positively embraced these activities, appreciating the chance to gain international exposure at home.

Evaluation

The project's impact was gauged through questionnaires and CTE surveys. Feedback from participants was overwhelmingly positive, with students expressing a better understanding and heightened interest in ESG/ Responsible Business principles.

Dissemination, diffusion and sharing of good practices

The project's best practices were shared with other faculties in various presentations. The six sets of micro-modules developed during this project have been made available for continuous access. A project website was established to promote the event and this new pedagogical strategy.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Comprehensive Resource Pack for Virtual T&L**
Principal supervisors and unit:	**Dr. David Chow, Department of Decisions, Operations and Technology** **Dr. KU Kei Tat Fred, Department of Decisions, Operations and Technology**

Brief description of the project

The project aimed to develop a comprehensive set of online teaching and learning resources for two core courses: DSME1030 (microeconomics) and DSME1040 (macroeconomics). The goal was to enhance students' learning experience in a virtual environment.

Activities and/or outcomes

The project resulted in a library of 20 sets of comprehensive online teaching and learning materials on various economics topics. These resources facilitated self-paced learning for students in virtual environments.

Impact and results achieved

The T&L materials developed were shared with 5-7 teachers directly, impacting around 2,000 students per academic year. Students learnt the economics concepts underlying current trending business problems via carefully designed T&L materials. The project team also explored new strategies, e-learning pedagogies, and the development of online assessment methods.

Evaluation

The project's impact was gauged through Course and Teaching Evaluation (CTE) surveys, which showed overwhelmingly positive feedback from students. Students appreciated the flexibility of the new virtual teaching and learning materials, which allowed them to manage their learning process better and increased their level of engagement.

Dissemination, diffusion and sharing of good practices

The project team shared the best practices identified in the project in various conference presentations.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Long Distance Running Online Training Workshop**
Principal supervisor and unit:	**Dr. LEUNG Fung Lin Elean, Physical Education Unit**

Brief description of the project

The workshop was implemented in AY2022-23 and promoted in required and elective PE programmes. Its video series help students learn proper running techniques, training planning and improve their physical and mental health.

Activities and/or outcomes

Under the influence of the epidemic, 1315 students participated in the activities of the workshop through the Physical Education Unit's (PEU) website. Students in six required PE classes and two elective PE classes, and student-athletes from the Track & Field and Cross-Country teams were involved.

Impact and results achieved

The video series were integrated into the teaching syllabus, with student feedback and a 10km test required for qualification to provide suggestions. The Track & Field team athletes and coaches have provided feedback. The workshop was shared during the Summer Sports Programme and was well received as a platform for learning about running techniques, training methods, etc.

Evaluation

Students watched the video series and completed an online survey in Semester 1 2022-23. Seven questions were asked and students were required to rate from 1-5, with "1" being strongly disagree and "5" being strongly agree. In total, there were 1765 responses.

Dissemination, diffusion and sharing of good practices

In Fall 2022, PE students and university sports team players conducted a survey to evaluate the project, but there were challenges in disseminating the platform due to the pandemic. With eased epidemic policies, the project's diffusion may increase. The PEU will continue to integrate the VTL project into the teaching syllabus and arrange lecturers to share its existence.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Immersive Virtual Reality Modules for Virtual Teaching & Learning (VR-VTL) of Key Multi-Disciplinary Concepts in Image-Guided Robotics and Perception**
Principal supervisor and unit:	**Professor REN Hongliang, Department of Electronic Engineering**

Brief description of the project

The project aims to develop a cost-effective and immersive virtual reality educational platform for teaching the fundamental engineering theoretical aspects involved in robotics, image perception, intelligence and the associated medical applications. Immersive virtual reality (VR) is an effective way to inspire interest and understand the insight philosophy.

Activities and/or outcomes

The outcome and specific aims include developing key virtual reality modules in 1) anatomical imaging/modeling, 2) planning & visualization, 3) surgical navigation.

Impact and results achieved

Outcomes of activities achieved:

- Successfully finished the volume rendering of anatomy images
- Successfully enter the VR mode and connect to the VR headset using the smartphone.
- Finishing the transform matrix to make the model shift and rotate to the correct position
- Demo the real VR glasses and VR controller.

Evaluation

We did face2face, Blackboard and Zoom for VR video demonstration to FYP (final year project) students, ELEG3103 "Robotic Perception and Intelligence" (~20 students), ELEG5757 "Intelligent Wearable Electronics" (~12 students), and ELEG5600 "Advanced Perception for Intelligent Robotics" students (~20 students).

To gauge its usefulness in medical and educational environments, a questionnaire based on ISO-9241/110 Ergonomics of Human-Machine Interaction was provided to engineering students. Our evaluation indicates that we can achieve our objectives.

Dissemination, diffusion and sharing of good practices

1) Project website: https://sites.google.com/view/xrigi/home
2) Github open-source code/demo/data
   https://github.com/chunghei0116/ThreejsAR (FYP AR project demo)
   Github open-source code/demo/data https://github.com/Yizheng-Sun/Unity-3D-Model-To-Three.js-Web by CUHK undergrad visiting student Sun Yizheng in Prof Ren's lab

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Remodeling of Health Professional Education: Real Time Three -dimensional (3D) Gamification for Student Engagement in Virtual Learning Environment**
Principal supervisors and unit:	**Dr. TANG Mei Kuen Florence, School of Biomedical Sciences** **Dr. HWANG Shui Shan Isabel, School of Biomedical Sciences**

Brief description of the project

In this project, our team aim to

1) incorporate the metaverse concept for setting up the real-time multi-player 3D interactive Gamified Platform (Re3D IG) supporting health professional education and
2) identify students as partners in co-creating and co-developing massive multiplayer online gamification (MMOG) using VR and AR technologies.

Activities and/or outcomes

Initiative Outcome	Beneficiaries
1 VR initiative related to the respiratory system is the supplement for the in-class activities during the practical	Health professional students
2 AR initiatives related to the digestive system and nervous systems are • the supplement for the in-class activities during the practical • the self-reflection courseware, which will be launched in App Store or Google Play soon once fixing the bugs	Health professional students and Secondary students (demonstration)
1 micro-module related to the respiratory system is part of the context in the respiratory system for the self-study in the Blackboard system after-class activities	Health professional students
2 deliverables of 3D digital images of the heart (cardiovascular system) and kidney (urinary system) launch in the ePS (electronic Professional study) platform for the self-study in Blackboard system after-class activities	Health professional students

Impact and results achieved

Our team has arranged several contests in the active learning activities by using VR/AR initiatives for health professional students in regular teaching classes during the last academic year 2022-23, including biomedical sciences, Chinese Medicine, Pharmacy, and Biomedical engineering programs. During the practical class, three to four students are assigned to join the same learning environment doing the gamified competition. The highest-score students were awarded the book coupon. After their participation, students were invited to fillin the e-questionnaire. The data from e-survey was collected and analyzed. The data collected were about teachers' perception of the application of virtual teaching and learning initiatives via the eSurvey. Approval from the Survey and Behavioural Research Ethics Committee of The Chinese University of Hong Kong has been granted before the survey conduction.

Evaluation

Quoting the statement of Confucius, 'I hear I forget, I see I remember, I do I understand', AR and VR initiatives of Re3D IG provide an entertaining, stimulating and motivating platform for learners to study cognitively. All students have mobile devices for installation of the deliverable. This will allow students to access the learning content at any time and any place. The project hits the full interactive learning trends.

The project will be further explored if it is an innovative and sustainable initiative for future pedagogical education.

Dissemination, diffusion and sharing of good practices

Our team has developed innovative, interactive, communicative and reflective approach courseware – real-time 3D massive multi-player online gamification for enhancement and perceived motivational support of health professional education. Moreover, the advancement of the project is to serve the urgent need for hybrid teaching for the long-term impact in the exploration of the future educational tool in virtual teaching and learning in universities.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title: **Virtual Practicum in Chinese Medicine**

Principal supervisor and unit: **Dr. CHAN Sze Nga Sarah, School of Chinese Medicine**

Brief description of the project

- This project aims at providing virtual practicum and virtual clinical skill training in Chinese Medicine.
- Typical patients are chosen and the details of the patients are collected.
- Patients provide the responses to the questions that may be asked by the students and each response is video-taped separately.
- Other information that can be examined by the students, such as the facial color and the tongue of the patients are also video-taped.
- The cases can be used in two ways:

  (i) *Teacher-led training:* Teachers show the video clips to let the students experience virtual practicum and practice diagnostic skills. Students can see the video of a patient coming in the consultation room. The students then ask questions and examine the patient. Teachers will show the relevant video clips according to the students' question. After that, the students need to make diagnosis and suggest treatment. Teachers debrief at the end.

  (ii) *Self-practice:* The cases are incorporated into the software (AI patient, the existing project). Students can choose the related questions and the corresponding answers will be shown as video, rather than words. Students can have a more realistic feeling and are able to examine the patients' facial color, the voice, the appearance and the tongue by visual perception. Students then need to analyze the etiology and pathogenesis of disease, make diagnosis and suggest therapeutic treatment plan in online mode. Correct answers will be shown at the end of the practice.

Activities and/or outcomes

Outcome

1. To enhance the clinical skill through the process of virtual patient interview.
2. To develop the ability of interrogation, analysis of the etiology and pathogenesis of disease, making TCM syndrome diagnosis, and proposing treatment, in various specialties of Chinese medicine.
3. To learn the experience of different clinical teachers.

Impact and results achieved

10 clinical cases have been set up. 10 typical patients have been chosen and the details of the patients were collected. The patients provided the responses to the questions that might be asked by the students and each response was video-taped separately. Other information that can be examined by the students, such as the facial color and the tongue of the patients were also video-taped. The cases were incorporated into a platform. Students can type in the questions they want to ask the patient for collecting information and the corresponding answers will be shown as video. Students are able to examine the patients' facial color, the voice, the appearance and the tongue by visual perception. Students then need to analyze the etiology and pathogenesis of disease, make diagnosis and suggest therapeutic treatment plan in online mode. Correct answers and debriefing will be shown at the end of the practice.

Number of beneficiaries

Course type	Course Code	Programme Name	Estimated Class Size

Chinese Medicine courses including practicum and internship and various Chinese Medicine clinical subjects	Various Chinese Medicine clinical subjects: BCME3105, BCME3209, BCME3106, BCME3110, BCME3102, BCME3202 Practicum and Internship subjects: BCME2401, BCME2402 BCME2403, BCME2404 BCME2405, BCME4101 BCME4103, BCME4104	Bachelor of Chinese Medicine	Include year 1 to year 6 courses with 25 per class, Around 150 students in total

Evaluation

Method	Detail
Student focus group study	Students expressed that it is a good self-learning tool for practicing diagnostic skills. The patient videos make the diagnostic process realistic and supplement the bed-side learning. However, students indicated that 10 cases are not enough and more cases of different specialties should be made for better learning. Also, the platform can only be accessed with CUHK VPN which may not be that convenient to use.
Teacher's feedback	Teachers welcomed the idea of video-taping some typical cases for teaching materials and the learning platform arouse the learning initiative of students.

Dissemination, diffusion and sharing of good practices

A systematic production procedure has been developed and 10 clinical cases have been set up for students to use. More clinical cases of various specialties can be collected and filmed in the future. All clinical courses can use the cases in the database for teaching. This model can also be used in other programmes that involved clinical training. Successful cases and experience have been shared in our department and introduced in the Virtual Teaching and Learning Innovation Expo 2023.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Implementing the Strategies of Self-paced and Tutor-adjusted Structure, Classroom Engagement Tools, and Flexible Online Interaction into an Innovative Flipped-classroom Problem-based Learning Model to Enhance Virtual Learning in Ophthalmology**
Principal supervisor and unit:	**Professor CHAN Pui Man Poemen, Department of Ophthalmology and Visual Sciences**

Brief description of the project

To enhance the current ophthalmology teaching scheme with VTL by (1) self-paced and tutor-adjusted structure for the pre-class materials, (2) strategies ("random name picker" and "online stopwatch") that could enhance student-tutor interaction and engagement during class or online class, and (3) flexible online interaction with new chat box function in our e-learning website and students' initiative of setting up discussion platform.

Activities and/or outcomes

We made 68 MCQs (for 12 teaching videos) for the self-paced tutor-adjusted pre-classroom system. We set up a chat box function on the teaching website, utilized the "random name picker" and "online stopwatch" during class (online and face-to-face). 80 students joined the activity and evaluation. The project also led to 3 surgical wet labs (>100 ophthalmologists), 3 online surgical wet labs (with ORBIS, 9 ophthalmologists in Northeast China), 1 ORBIS webinar in Mandarin (>50 ophthalmologists in mainland China), and 4 clinical skill learning sessions (228 medical students) and 2 pre-internship workshops (108 medical students).

Impact and results achieved

The project led to the setup of an optional "pre-internship workshop" as a formal part of the ophthalmology curriculum at CUHK. The project's impact and results achieved satisfied the needs of CUHK medical students and beyond. This include postgraduate students, ophthalmologists, and outreaching ophthalmologist in other regions (mainland China and Southeast Asia). Some of the teaching materials are reusable. The Principal Supervisor also received an award for the project.

Evaluation

Feedback showed that the "random name picker" was very helpful. "Chat box" and "stopwatch" were less useful. The opinion of the pre-classroom system is fair but some students felt some burden with the exercise.

Dissemination, diffusion and sharing of good practices

We present the projects at various events. This included 1x journal publication in Academic Medicine, 2x invited lectures, 1x hospital grand round, and 1x department meeting.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Gamification of Chemistry Experiments and Laboratory Techniques Using an Integrated Smartphone-based Augmented Reality Platform**
Principal supervisor and unit:	**Dr. CHAN Ka Long Donald, Department of Chemistry**

Brief description of the project

- The project incorporates chemistry experiments and laboratory techniques onto *Quest2Learn*, an integrated virtual learning platform based on smartphone and augmented reality (AR).
- The project involves students in the development of the learning modules, together with students and faculty members from Johns Hopkins University.

Activities and/or outcomes

- Five AR learning modules were produced and incorporated into the platform.
- The learning modules cover essential laboratory techniques in analytical chemistry: (i) handling of laboratory apparatus; (ii) operation of instruments; (iii) determination of concentration of an unknown solution.
- Pilot implementation of these modules was carried out in 5 laboratory courses in the two universities.

Impact and results achieved

- Enhancement of students' learning experience was evaluated through specific questions.
- Constructive feedback and suggestions indicated that students made efforts to learn and compare between virtual and actual experiments.

Evaluation

- The instructions and explanations are clear, the AR features are helpful and user-friendly, and the modules are interrelated with increasing difficulty.
- Improvements include optimizing user interface and correcting typos.

Dissemination, diffusion and sharing of good practices

- *Quest2Learn* webpage and mobile app are available.
- Experience of virtual teaching and learning adoption and engaging students as partners in teaching development could be shared with different units through workshops or informal communication.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Development of Online Learning Tools for Non-physics Majors Taking Introductory Physics and General Education Courses**
Principal supervisor and unit:	**Dr. LEUNG Hoi Tik Alvin, Department of Physics**

Brief description of the project

The Department of Physics provides introductory courses and general education courses to students from other Departments and Faculties. To improve the experience of non-major students learning physics, we have developed an online e-learning video platform and launched a YouTube channel. The videos on the e-learning platform can be used by different levels of learners through self-study. It is envisioned that these new resources can enhance the scientific literacy of students and promote their self-learning ability in the long run.

Activities and/or outcomes

The first phase of the project focused on the development of tutorial videos for introductory physics courses. The second phase of the project, which lasted from December 2021 to December 2022, focused on the production of popular science videos. These videos were released on the YouTube channel "WaNeiG 話你G".

Impact and results achieved

The e-learning website and YouTube channel contain many videos to enhance the science learning experience of non-physics major students. In general, the performance of the students has improved after the launch of the e-learning website.

Evaluation

To assess the effectiveness of these new resources on enhancing physics education, the following data were collected.

1. Student feedback
2. Number of views of the videos
3. Teacher feedback
4. Test and exam results

Dissemination, diffusion and sharing of good practices

In addition to producing a short video as required by the grant committee, the details of the project were presented in CUHK Teaching and Learning Innovation Expo 2022.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title: **Student Assessment with Individualized Datasets**

Principal supervisor and unit: **Dr. WRIGHT John Alexander, Department of Statistics**

Brief description of the project

The objective of this project was to build an easy-to-use platform for instructors to create individualized assessments, wherein students receive the same questions but with data unique to themselves. Although the original motivation was to help reduce cheating in online or take-home exams, the platform could of course be used to set assessments in face-to-face mode. As such, the platform will help existing practice and is applicable to any course in which calculation plays a role. The platform we have created is a basic "proof of concept" version, which we hope could be expanded and improved upon in future.

Activities and/or outcomes

The key outcome of the project is a web platform http://sawid.sta.cuhk.edu.hk/ where instructors can create an account and disseminate assessments with data unique to each of their students.

Impact and results achieved

SAWID was used by 4 instructors and across several courses taught by the Department of Statistics, delivering unique assessments to hundreds of students.

Evaluation

Feedback from instructors was extremely helpful and uniformly positive. From their side, students found using SAWID as easy as receiving their assignments by email.

Dissemination, diffusion and sharing of good practices

A presentation was delivered at the Teaching and Learning Innovation Expo 2022 and participants are given a demo for how it works. Furthermore, a video was made available at the Virtual Teaching and Learning Innovation Expo in the Metaverse.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Accumulation of E-resources and Acceleration of Latest Analysis Dissemination**
Principal supervisor and unit:	**Professor CHAN Kin Wai, Department of Statistics**

Brief description of the project

This project proposes a Forum-and-News platform with hashtags, pop-up recommendation, example-base discussion, social-media type interaction function, and copiable codes. The platform includes a database of discussions tagged with lecture notes, personalized recommendations, and a newsfeed for discussing real-life data analysis with short stories and hand-on codes. This serves as a flip-classroom strategy and connects students' knowledge with real-world problems.

Activities and/or outcomes

The proposed platform achieved multiple outcomes, including providing a space for anonymous questions and discussion, motivating multiple forms of interaction, enabling learning of real-world problems, and allowing for online assessment of students and teaching methodology. The platform was accessed by 301 enrolled undergraduate students and 1799 general users during the implementation period.

Impact and results achieved

Three measures were used to gauge the impact of the platform. First, official course evaluations conducted by CUHK showed that the platform received full scores for online teaching-enhanced understanding, appropriate materials for online learning, and effective online platform to promote interaction. Second, the platform was compared to Blackboard discussion forum in terms of number of participants and discussions, and the platform significantly promoted interaction and participation. Third, randomised experiments showed that pop-up learning recommendations on the platform were statistically significant in motivating students to read more examples.

Evaluation

The proposed platform is an innovative and promising initiative to improve interactive and example-based discussions. The emphasis on features such as hashtags and pop-up learning recommendations makes learning more enjoyable, engaging, and effective. The Forum section is impressive in creating a new way of engaging in academic discussions, while the News section expands knowledge beyond the classroom. To enhance the initiative, further marketing and promotion is recommended. With minor adjustments, the platform is a valuable resource for students and educators in other courses.

Dissemination, diffusion and sharing of good practices

The proposed platform covers 3 undergraduate courses, providing 431 examples, 1013 discussion threads, 145 micro-modules, and 5000+ social-media-type interactions. Systematic storage of all discussions and resources in a database facilitates easy searching and filtering for future students. The platform emphasizes multiple forms of interaction, making it engaging for students.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Virtual-Reality (VR) Tourism Mission Game: An Integrated Platform of Student Engagement, E-Learning Management System and Game-based Learning**
Principal supervisor and unit:	**Professor CHAN Chung Shing, Department of Geography and Resource Management**

Brief description of the project

This university-level project produces a virtual reality (VR) mission game platform that connects sustainable tourism with different local places in Hong Kong. The platform utilizes tasks such as multiple-choice questions, open questions, VR image observation, and more.

Activities and/or outcomes

The project creates an online game platform that contains a set of 14 locations with specific tasks as missions to complete. These tasks include multiple-choice questions, open questions, VR image observation, and more. The platform also includes VR images of urban tourist attractions, cultural and historical heritage sites, countryside ecological areas, and other locations. The tasks are related to various sustainable tourism topics or areas of knowledge, such as nature conservation, cultural and historical heritage, tourism impact assessment, destination planning, and visitor management.

Impact and results achieved

The project outcome, the game platform, has been shared with students in multiple courses, and even beyond CUHK to The Education University of Hong Kong (EdUHK). The project team also shared the game idea and development process with other local and non-local universities through workshops and educational expos, generating interest from faculty members and participants in potential future collaborations.

Evaluation

The evaluation of the project outcomes has shown overall positive feedback from student users at CUHK through a user survey on the game experience with a sample of 109 students. The survey results show positive overall satisfaction with the game experience, with competence in terms of knowledge enrichment about sustainable tourism, SDGs, and selected places in Hong Kong.

Dissemination, diffusion and sharing of good practices

The project team evaluated the impact of the project outcomes through several approaches, including game design and testing workshops that involved CUHK students in providing feedback and ideas on the game functionalities and experiences; game platform delivery events and activities, which mainly consisted of gameplay and sharing sessions with students from a total of six courses during the project period; and academic and public dissemination events, including two VTL expos and an invited experience sharing workshop in another local institution.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Virtual Overseas Field Trips for Geography Teaching and Learning**
Principal supervisors and units:	**Dr. WONG Kwan Kit, Frankie, Department of Geography and Resource Management** **Professor CHEEWINSIRIWAT Pannee, Chulalongkorn University**

Brief description of the project

Overseas field study course plays an important role in geography learning. Over the years, the Department designed field study course with collaboration of universities around the world. The hit of the pandemic has significantly affected the implementation of the overseas field studies in the current curriculum. In collaboration with the Geography Department in Chulalongkorn University (ChulaU) in Bangkok, Thailand, eight virtual tours covering land cover land use changes, urban settlement and planning, water resource management, sustainable tourism were developed in both Hong Kong and Bangkok so that students from both universities can learn virtually through the platform. Assessment matrices were designed to evaluate the virtual learning environment.

Activities and/or outcomes

1. Various learning materials including aerial photos, videos, articles were included in the virtual field trips. Quizzes and discussion forums were also set up to allow students learn actively, self-check their understanding and exchange ideas.
2. An online field trip course was specifically set up by ChulaU to provide some basic knowledge and understanding about topics explored in each virtual tour.
3. Assessment tasks were designed for students from both universities to work in groups. Such collaboration allowed them to exchange ideas and knowledge.

Impact and results achieved

1. The workflow and platform used to develop the virtual overseas field trips shed some lights on how overseas field trips can be conducted.
2. The project outcomes demonstrate how virtual overseas field studies can be formulated and extended to other destinations or even for local field trips.
3. The collaboration with ChulaU not only enriched the contents in the virtual field trips, but also create a learning environment allowing students from the two universities to cooperate and learn together.

Evaluation

A questionnaire survey was set up based on “What Is Happening In this Class? (WIHIC)” to understand the designed virtual learning environment in 11 aspects and was filled by students from both universities who have participated in the virtual field studies.

Dissemination, diffusion and sharing of good practices

The project objectives, methodology and outcomes were shared with colleagues in the Department of Geography and Resource Management in the annual teaching and sharing session on 8 May 2023. After the analysis of the questionnaire survey results, the pedagogy and outcomes will be shared by submitting an article to a peer-review journal and present a paper in a local or overseas conference.

THE CHINESE UNIVERSITY OF HONG KONG

Funding Scheme for Virtual Teaching and Learning

Project title:	**Developing a Virtual Field Trip with E-Modules and Mixed Reality Technologies to Complement a Physical Field Trip**
Principal supervisor and unit:	**Professor HE Ying Sylvia, Department of Geography and Resource Management**

Brief description of the project

A mixed-reality (MR) model has been developed to help students explore and plan Songdo-dong, South Korea's world renounced smart city. The MR model features a 3D city model that integrates a suite of geospatial data. The MR model provides a novel interactive platform for students to explore and design components of a smart city, as well as a viable alternative to conduct field studies virtually.

Activities and/or outcomes

The MR model has been delivered towards the end of the spring semester 2023. It was introduced to students in GRMD2501: Theory and Practice of Smart Cities. The students were pleased with their hands-on experience with the latest technology as applied in their field.

Impact and results achieved

This project introduced MR as one of the latest virtual reality technology to our teaching. The proposed output – a virtual fieldtrip based on our MR project – is expected to improve the quality of virtual fieldtrips that have replaced physical fieldtrips. The MR product that we have developed have interactive elements which will encourage teacher-student and peer interactions. It will have a lot of room for the students' creative solutions to improve the urban planning in smart cities.

Evaluation

With future development of the MR technology and more production companies focusing on this technology, we believe more applications using MR can be developed for VTL.

Dissemination, diffusion and sharing of good practices

The project team gave a talk in the Department's Annual Teaching Sharing. The project team also submit a paper to the VTL Innovation Expo. A short video was uploaded to the Principal Supervisor's LinkedIn page.