THE CHINESE UNIVERSITY OF HONG KONG

Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Evaluation of the Impact of Online Teaching on Students with Special Educational Needs (SEN)**
Principal supervisor and unit:	**Professor LEE Wing Yan Vivian, Centre for Learning Enhancement And Research**

Project objectives

1. To investigate the difficulties SEN students faced in online classroom.
2. To provide guidance to teachers to raise their awareness about SEN students' challenges.
3. To provide recommendations for the betterment of online teaching targeting to SEN students.

Activities, process and outcomes

1. Two online questionnaires for all the undergraduate SEN students and teachers were sent through emails.
2. Individual interviews of the SEN students and teachers were conducted.
3. Four micro-modules are produced to provide tips and recommendations to teachers to raise their awareness about students with special learning difficulties.

Deliverables and evaluation

A representative group of 8 SEN students and 23 teachers answered the questionnaires while 10 SEN students, 8 teachers and 2 staff were interviewed in January 2021. Findings showed that physical disabled students have more difficulties in technology-related issues. Non-physical disabled students found it difficult to concentrate in ZOOM lessons and therefore mentally overloaded. Most of the SEN students being interviewed have mental illnesses that they stressed out easily. Teachers' main difficulty was being unable to identify SEN students in online classes.

Dissemination, diffusion and sharing of good practices

The finding of the project was presented at CUHK Teaching and Learning Innovation Expo in July 2021.

Impact on teaching and learning

Pedagogical suggestions include adopting the universal principles in instructional design; encouraging peer support; constructing a more structured learning environment and providing more individual consultations to the SEN students.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**MASCOT: A Mobile Application for Students' Complexity of Thinking**
Principal supervisor and unit:	**Dr. WU Jun Vivian, Office of University General Education**

Project objectives

This project is proposed to design and to develop an interactive web application named MASCOT for students to self-evaluate their thinking complexity and to obtain immediate suggestions on future improvement.

Activities, process and outcomes

Collaborating with the Information Technology Services Centre (ITSC), the team designed and developed MASCOT from November 2020 to April 2021. Then, the team invited students to use MASCOT after 2020-21 Term 2 and during 2021-22 Term 1. 332 responses were collected, and 268 valid data were obtained.

Deliverables and evaluation

The team also invited students to provide feedback on MASCOT through questionnaire. Moreover, 2 rounds 6 focus group interviews were conducted in June 2021 and January 2022 to get in-depth feedback of students on MASCOT. The feedbacks are positive. Based on the 132 questionnaire responses, 92% of the students agree (in 6-point Likert Scale) that MASCOT can help them further reflect on their learning in General Education Foundation (GEF) courses and 93% agree that the suggestions provided by MASCOT are useful for their future improvement on the thinking complexity.

Dissemination, diffusion and sharing of good practices

So far, there are five GEF teachers that have used MASCOT in their classes. The team has given two oral presentations. One journal paper has been accepted and will be published by 大學通識教育聯盟.

Impact on teaching and learning

Findings in this project will be integrated into the Narrative Qualitative Analysis study which contains both student self-evaluation and teacher evaluation components, to systematically understand students' cognitive characters, development, and the teaching effectiveness of the GEF courses.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Cultivating the College as a Community of Learners in Dialogue**
Principal supervisor and unit:	**Dr. CHIU Chi Ming Lawrence, S.H. Ho College**

Project objectives

The name of this project, "Cultivating the College as a community of learners in dialogue" suggests its two ultimate goals, 1) to build a community of learners in dialogue, 2) to cultivate the College as a community.

Activities, process and outcomes

In Term 1 2020-21, 16 senior student teaching assistants were recruited for GESH1010 "Orientation and Outreach" course. These assistants worked on enhancing the interactivity of an online classroom. They designed warm-up exercises, led in-class discussion, and offered after-class support to address students' learning needs.

The project also supported College students to hold online activities, which facilitated the adaptation of year 1 students and built their belongings to the College. Activities included virtual communal dining, CGE workshop and Cantonese class. Evaluation survey showed students were satisfied with the course delivered online and other online activities.

Deliverables and evaluation

Feedback from Course and Teaching Evaluation (CTE) Survey proved the participation of teaching assistants helped the lessons more "relatable" and "interactive". Students were more engaged in the lessons and more adapted to the College. In particular, 94% of CTE questions scored over 5 on a 6-point scale and course satisfaction scored 5.42. From observation, over 80% students turned on their camera in class.

Other online activities were also welcomed by the students. In the post-activity questionnaires, the teambuilding workshop scored 4.25, Cantonese elementary class (Term 1) scored 4.83 and Cantonese intermediate class (Term 2) scored 5 on overall satisfaction on a 5-point scale.

Dissemination, diffusion and sharing of good practices

The project experience was shared to other colleagues in a lunch seminar on 14 April 2021, organized by Baldwin Cheng Research Centre for General Education, CUHK. Theme of the lunch seminar is "*Building College Life under the New Normal: Challenges to Colleges and Their Responses"* with attendance of 40.

A video summarizing the project is also created for future sharing: https://youtu.be/XOHTgvm2tL8

Impact on teaching and learning

From the project results, it can be concluded that engagement of students as partners in curriculum development is an effective way to:

- integrate innovative teaching activities in transition to online teaching
- make learning more relevant to students

Increased interactivity and relevance of lesson can motivate students' active learning and hence enhance their academic performance.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Promoting Peer Learning through Digital Exhibition for Cultural Management Programme**
Principal supervisor and unit:	**Professor CHUNG Ming Yan Fanny, BA Programme in Cultural Management, Faculty of Arts**

Project objectives

1. Create an engaging environment with the online learning and teaching platform that promotes positive learning attitude towards online learning;
2. Create a digital exhibition for facilitating a culturally-entrenched and stimulating online learning environment for the CUHK students, teachers, and the public;
3. Develop students' creativity in art marketing, intellectual diversity, and knowledge and skills in Cultural Management through a creative project with the creation of marketing posters and digital exhibition;
4. Promote opportunities for peer-learning and peer-assessment with the interactive online learning and teaching platform through the process of critical inquiry and reflection;
5. Bring about digital approach to the learning and teaching of the B.A. Programme in Cultural Management.

Activities, process and outcomes

- **Online workshops** to let students learn about how to design marketing posters for audience building of the cultural organizations.
- Commencing the **creation and design of a digital exhibition** for displaying the posters.
- Students had **online discussion** sessions with the peer learning groups and course instructor for the design of marketing posters and creation of digital exhibition; Web domain created.
- Students had their **marketing posters submitted.**
- Each student gave a **brief presentation** on the design of their poster and answer questions from the peers and the course instructor.
- **Marketing posters displayed in the fully established digital exhibition.**

Deliverables and evaluation

- Deliverables: (i) Online Workshops; (ii) An online exhibition; (iii) A conference presentation; and (iv) A video for experience sharing.
- All the themes and focus areas included in the original proposal have been achieved.

Dissemination, diffusion and sharing of good practices

This project has greatly promoted students' awareness in the role of digital platforms in the advocacy of arts and culture, and has practically and theoretically enhanced students' skills and knowledge in audience development and curating online exhibition for the cultural industry during the time of crisis, i.e. COVID-19. These experiences have significantly equipped students with necessary knowledge and skills for facing various challenges and crisis in the 21st century.

Impact on teaching and learning

Interactive peer learning in this project has greatly contributed to a high level of student engagement in the online learning environment, as evidenced by students' high attendance rate (i.e. close to 100% in all the workshops), increased rate of turning on videos during zoom classes/workshops, and increased interaction during online classes/workshops (e.g. verbal and written interaction).

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Deepening Cognizance of Student Needs and Engagement with the Learning Process in the Arts: A Faculty-wide Enquiry**
Principal supervisor and unit:	**Professor MORLEY Ian, Department of History**

Project objectives

1. To determine how Arts students' online teaching and learning needs can be enriched;
2. To robustly comprehend the processes that bestow academic success for learners;
3. To aid the design of teaching strategies so that guided knowledge growth and learning motivation can be heightened.

Activities, process and outcomes

A number of fundamental activities were carried out, e.g. researching students' online teaching and learning perceptions, distributing questionnaires and undertaking interviews, and disseminating project findings. Also dialogue was established with the Arts Faculty's Associate Dean of Teaching, and discussions formed between staff of different Departments.

The project, thus, was able to draw upon a depth of information as to student perceptions of online teaching and learning. In encouraging the students to breakdown their comprehension of online education they offered data as to how individual courses, and in turn curricula, broadly work. Plus, the project offered a window for learners to expose what academic success is, and how it can be brought into being when education is grounded in the online environment/context.

Deliverables and evaluation

Deliverables, re public dissemination, by the end of 2021 will be a presentation at CUHK's eLearning Expo, a presentation at an international event (to be held in the Philippines), and the publication of a short paper in a peer-reviewed journal. However, an additional deliverable is to commence discourse with the Associate Dean of Education in the Arts Faculty at CUHK, this new information is to feed into a new faculty-wide project (funded in 2021) of which this project's PI is a member/Co-I.

Dissemination, diffusion and sharing of good practices

To date, one presentation has been given at a conference, another is to be given in late-2021, and a short paper has been sent to a peer-reviewed journal (and is to be published in late-2021/early-2022). It is anticipated in the future too that a presentation will be given within the PI's faculty at CUHK, and/or as part of a workshop organized by CLEAR (Centre for Learning Enhancement And Research) or ELITE (Centre for eLearning Innovation and Technology).

Impact on teaching and learning

Although CUHK teaching staff are now conducting face-to-face teaching, the fact that the project sought to find out, and understand why, students held particular views re online education was well-received. Students willingly supplied their views on a host of teaching and learning matters, however in the coming months the PI will strive to drive forward the projects findings and in so doing translate it into shared knowledge amongst Arts Faculty staff. Moreover, when the publication is put into the public domain teaching staff will have a new reference to study and ponder when putting future attention back onto the development of online education procedures should unexpected severe social disruption occur again or hybrid teaching is widely promoted.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Understanding Chinese Characters through Videos and Online Exercises**
Principal supervisor and unit:	**Professor HOYAN Hang Fung Carole, Yale-China Chinese Language Centre**

Project objectives

This project is to produce online animations and related exercises to facilitate international learners of Putonghua (Mandarin) and/or Cantonese to acquire 200 high-frequency Chinese characters.

Activities, process and outcomes

The following preparation has been carried out for creating the learning materials: (i) 200 Chinese characters were selected from HSK syllabus and the Yale-China Chinese Language Centre (CLC) textbooks; (ii) data collection for the selected Chinese characters was conducted. Based on this groundwork, the online Putonghua and Cantonese learning packages comprising PowerPoint slides, videos and related exercises are created.

Deliverables and evaluation

By the end of April 2022, the production of all the 10 PowerPoint slides and 8 out of 10 videos of Putonghua and Cantonese will be completed respectively. Also, 10 sets of Putonghua complementary exercises, which contain 6 types of questions with 40 questions each, will be produced by then. For Cantonese, all the worksheets and tests, as well as the complementary exercises based on newspaper reading and other reading materials will be created too. This project is in line with the strategic plan of the University which plays a part in providing a new learning experience for international learners of Putonghua and/or Cantonese in a unique online setting.

Dissemination, diffusion and sharing of good practices

All the online learning materials are/will be posted on Google Classroom. The 10 respective videos of Putonghua and Cantonese will be uploaded on CLC's YouTube channel after the completion of production.

Impact on teaching and learning

Students' feedback was positive. They particularly liked the videos and online exercises, which they found very useful for learning Chinese characters.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Flipped Classroom Preparation for Elementary Putonghua Reading & Writing I**
Principal supervisor and unit:	**Ms. LIU Zhenxia, Yale-China Chinese Language Centre**

Project objectives

The main objective was to create a set of micro-modules (MMs) following the content of the new textbook of CLCP1113 "Application of Vocabulary and Grammar I" following a flipped classroom model. The MMs include eLearning exercises, character videos, grammar videos, and a corresponding set of materials in traditional characters for those who wish to study both simplified and traditional.

Activities, process and outcomes

All eLlearning exercises and grammar videos have been completed and piloted with students taking CLCP1113 "Application of Vocabulary and Grammar I" in Spring 2022 with feedback collected. Furthermore, character slides have been prepared and a set of materials in traditional characters were also provided to interested students.

The materials undoubtedly enhanced the course, as students had multiple sets of eLlearning materials for each lesson both pre-lecture and post-lecture. Furthermore, grammar videos allowed students to review key points from the lessons and clear up some questions that they had. Students attended lecture more prepared after completing the preparation exercises, which were designed to make sure students previewed the lessons ahead of the lectures so that everyone came to class with a baseline level of understanding.

Deliverables and evaluation

The deliverables of this project are the above-mentioned materials. Evaluation includes written feedback from students.

Dissemination, diffusion and sharing of good practices

This project will be presented at the upcoming CU Teaching and Learning Innovation Expo (2022) in July should we receive an invitation to do so.

Impact on teaching and learning

Students reported that the various Blackboard exercises and the voiceover PPTs helped them prepare for lecture, understand the content of each lesson better, and review what they learned in class.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22)

Project title:	**Real-time Auto-captioning Support System**
Principal supervisor and unit:	**Professor TANG Wai Lan Gladys, Centre for Sign Linguistics and Deaf Studies**

Project objectives

The project is to explore how real-time auto-captioning serves as an assistive technology in education can improve classroom information accessibility of students with Special Education Needs (SENs).

Activities, process and outcomes

The project consists of two different areas of testing: technical testing by EE and user experience testing by CSLDS. The technical testing evaluated the overall technical capability and the accuracy rates of two real-time auto-captioning software. The user experience testing consists of trials in online learning, questionnaire surveys and focus group discussions with the users. According to the results, auto-captioning tools with satisfying performance in accuracy and processing time are helpful in enhancing the attention and information accessibility of the students with hearing impairment or ADHD in this project.

Deliverables and evaluation

Documents including a simple guideline and a video showing how to use auto-captioning in class will be uploaded to the centre's webpage and provided to OSA (Office of Student Affairs) and ITSC (Information Technology Services Centre) for future support of SEN students.

Dissemination, diffusion and sharing of good practices

The use-case report based on the users' feedback and technical evaluation is a good reference for further review of other captioning systems. A sharing talk was conducted to help different departmental representatives understand the potential benefits of auto-captioning service to SEN students.

Impact on teaching and learning

The results of this project show that auto-captioning is a support measure that can enhance effectiveness of online learning of different types of SEN students.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Local-international Student Buddy Scheme: Problem-based Learning of Biomedical Engineering Issues from a Global Perspective**
Principal supervisor and unit:	**Professor HO Ho Pui Aaron, Department of Biomedical Engineering**

Project objectives

This Biomedical Engineering (BME) local-international student buddy scheme aims to foster cross-cultural study and peer learning as a global citizen. Students immersed themselves in a cross-cultural multi-lingual atmosphere to build co-operation and communication skills from their peers and professors.

Activities, process and outcomes

Seven faculty members from the Department of Biomedical Engneering had provided tailored guidance and advice from February to July 2021 to each team using a standardized pedagogical manner in an attempt to prepare students to join an online poster competition held in July 2021.

Deliverables and evaluation

This buddy scheme could successfully provide students insights in innovation ideation and implementation as well as perspectives for their future career (e.g. entrepreneurial, corporate, graduate school) as derived from the participants with surveys and interviews.

Dissemination, diffusion and sharing of good practices

Although a budget has been set aside to reward three best performing teams for travel support, the trips are yet to be conducted due to travel constraints. Two manuscripts have been prepared for submission to premier journals in education science. This should increase CUHK's international visibility in innovative teaching.

Impact on teaching and learning

This project has demonstrated a prototype scheme for online advocation of peer learning. While we may expect that the COVID-19 pandemic may continue for some time, universities need to develop similar innovative education concepts beyond online classes. We are one of its kind to facilitate local students to learn globally through leveraging the presence of international students in BME.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Development of A Simulink-based Software-Defined Experimental Platform for A Series of Communication Courses in Information Engineering Program**
Principal supervisor and unit:	**Professor CHEN He Henry, Department of Information Engineering**

Project objectives

This project aims to design and implement a Matlab/Simulink-based software-defined experimental platform for a series of communication courses in Information Engineering (IE) program, including ENGG2310 "Principles of Communication Systems", IERG3820 "Communications Lab", IERG3010 "Digital Communications", IERG4100 "Wireless Communication Systems", IERG4110 "Hands-on Wireless Communication", and IERG4230 "Introduction to Internet of Things".

Activities, process and outcomes

In the first half of the project, 15 Simulink-based experiments of various communication systems have been implemented and tested, covering common technologies in both analog communication systems (e.g., amplitude modulation) and digital communication systems (e.g., PSK and QAM systems). In the second half of the project, more teaching materials have been developed with an emphasis on orthogonal frequency division multiplexing and its real-world applications in Wi-Fi systems that we use every day. All the materials developed under the support of this project have been seamlessly integrated to form a new graduate course that is being taught in this term (Term 2 of 2021-22) under the course code and name—IERG6120 "Advanced Topics in Information Engineering I" Wi-Fi Signals and Systems. An undergraduate version of the course is under development and will be offered in 2023-24.

Deliverables and evaluation

The PI has shared the experience in the departmental communication course panel meeting.

Dissemination, diffusion, sharing of good practices and impact on teaching and learning

Supplementing the lectures with the materials developed in this project will facilitate students with better understanding of course materials and enhance their motivations and appreciations of the course as they can connect to the course materials to their daily lives.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Developing a "Cloud Teacher" for Individualized Learning: Artificial Intelligence and Big Data Analytics in Mechanical Engineering Education**
Principal supervisor and unit:	**Dr. HAN Dongkun, Department of Mechanical and Automation Engineering**

Project objectives

1. Build a "cloud teacher", which is a textual-based conversational agent for answering the questions from students in Mechanical and Automation Engineering via machine learning technologies.
2. Develop a set of Python programming codes for the "cloud teacher" autonomously learning in the area of VEX hardware assembling, Arduino and Solidworks programming.
3. Conduct Big Data Analytics based on students' historical questions, and provide prescribed teaching with individualized instruction on each student or provide focusing instruction for some common questions raised by students.
4. Develop a mobile APP with the intelligent conversational agent and implement it in 4 courses, i.e., MAEG1010 "Introduction to Robot Design", MAEG2601 "Technology, Society and Engineering Practice", MAEG3920 "Engineering Design and Applications", and UGEB2303 "Robots in Action".
5. Make 10 sets of remote controllable robotic arms by students with the help of proposed APP.

Activities, process and outcomes

The whole process of the project development can be generally divided into four parts: The first part focuses on training the intelligent agent with a database of fundamental knowledge of Mechanical Engineering related to the U.S. Mechanical Engineering Syllabus for Mechanical Engineering graduates. The second part is concerned with the training of the intelligent agent regards to a database of Arduino programming. The third part aims to train the intelligent agent with a database of VEX hardware assembling. In the last part, a mobile APP will be developed and implemented in an online robotic laboratory.

Deliverables and evaluation

Summary of project deliverables: (a) 1 set of Python programming codes developed for training the smart agent; (b) 1 mobile APP developed and implementation on 1 online robotic laboratory; (c) 2 presentations at local conference; (d) 2 local seminars; (e) 1 leaflet; and (f) 10 sets of remote controllable robotic arms.

Summary of evaluation methods for this project: (a) survey on the online laboratory learning experience towards the end of 4 courses; (b) survey on the user-experience on the conversational intelligent agent towards the end of 4 courses; (c) focus group interview with a small group of volunteer students of 4 courses; and (d) feedbacks at seminars and conferences.

Dissemination, diffusion and sharing of good practices

Summary of dissemination: 2 presentations in 2 seminars, 2 presentations in 2 local conferences.
Impact: Collaboration with an oversea University Cardiff Metropolitan University and got one external grant. Promoted by the Faculty of Engineering and got one internal extended grant. Replication in Faculty foundation courses and department elective courses.

Impact on teaching and learning

The rate of positive feedbacks of targeted courses are all above 70% in both the survey on the online laboratory learning experience and also the survey on the developed cloud teacher. The performance of students in some concerned assessments have been remarkably elevated in some targeted courses.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Using Superhero Films to Construct Transitional Courses to Assist Students in Developing their Learning Skills for University Studies**
Principal supervisor and unit:	**Professor GALLAGHER Steven Brian, Faculty of Law**

Project objectives

The project funding provided a research assistant who prepared materials to support the animated videos. The project had two objectives – to engage students with the law and to introduce law to them in a holistic form rather than as separated fragments. The project used superhero films to engage students with their law studies and help them transition from high school to university learning. Law schools traditionally teach law in discrete subject areas with students gaining analytical skills as they progress on their studies. This project reversed the traditional method of teaching law, beginning with a holistic view of the law and breaking it down into the usual categorisation of subject areas. The students first watched high-quality animated videos to introduce them to the issues they will consider in their law studies and the overlaps and interactions between them. They then had flipped classes, where they were required to identify the areas of law involved in superhero films.

Activities, process and outcomes

The materials were prepared. The course was delivered as a SPOC for the CUHK Summer Institute 2021. The course was delivered for Hong Kong solicitors as a Hong Kong Law Society accredited continuing professional development seminar on three occasions – once in 2021 and twice (so far) in 2022. The course will be delivered again as a SPOC for the CUHK Summer Institute in August 2022.

Deliverables and evaluation

The materials were provided and delivered as proposed. The only deliverable not achieved was the use of the course as a transitional course for CUHK LAW. With the recent experience of online teaching, it is submitted the course would work well as a transitional course and the Principle Supervisor will continue to lobby for the implementation of such a course.

The materials worked very well and received positive feedback from participants.

Dissemination, diffusion and sharing of good practices

The course and the materials have been presented at teaching and learning conferences including the Centre for Learning Enhancement And Research (CLEAR) Teaching and Learning Innovation Expo 2021, CUHK LAW's Directions in Legal Education Conference 2022, and as a seminar for CUHK LAW's teaching and learning in law seminars in 2022.

Impact on teaching and learning

- Students have commented in the CUHK Course and Teaching Evaluation (CTE) process that the materials supplemented the videos and online classes which enhanced their understanding and learning.
- Practitioners at the continuing professional development seminars gave very positive feedback on the materials and courses.
- From a teaching perspective, I found the materials very useful to refer students to and to initiate questions from the students and discussion.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Flipped Classroom Teaching to Enhancing Clinical Skills when Clinical Teaching is Restricted**
Principal supervisor and unit:	**Professor WONG Wai Tat, Department of Anaesthesia and Intensive Care**

Project objectives

Video and audio recordings of the clinical encounter from the ICU physicians' eyes and ears can partially supplement the lacking clinical context of learning clinical skills when bedside teaching is restricted due to the pandemic. Therefore we propose to produce pre-class eLearning material using a digital stethoscope and video recording glasses to record physical examinations from the ICU physicians' point of view. The newly developed eLearning material will likely engage the student in learning clinical skills and better prepare them for the limited opportunities of bedside clinical teaching during the pandemic.

Activities, process and outcomes

Three micro modules related to three abnormal organ functions: (1) Cardiovascular system; (2) Respiratory system; and (3) Neurological system are produced. These three micro modules will be presented in two formats in the eLearning platform. The first one will be an electronic tutorial format consisting of a series of questions prompting students to discuss the correlation between the clinical features and pathophysiology of the diseases. The second one will be a narrative presentation explaining the physical examination findings.

Deliverables and evaluation

Face-to-face teaching in ICU for final year medical students (in a group of 20-22 students every three weeks) will be resumed in late June or early July 2022. The new teaching material will be evaluated by three groups of students (around 60 students) attached to the ICU.

Dissemination, diffusion and sharing of good practices

The development process, students' participation rate and evaluation will be submitted to the CUHK Teaching and Learning Innovation Expo 2022 and the Asia Pacific Medical Education conference 2023 as an abstract or poster submission.

Impact on teaching and learning

With the availability of handy visual-audio equipment, teaching material using recordings of real patient's clinical condition can potentially engage medical students. This can be applied in undergraduate teaching of other specialties.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Engaging First Year MBChB Students in Learning Pre-clinical Biomedical Science Using Simulation Teaching**
Principal supervisor and unit:	**Professor WONG Wai Tat, Department of Anaesthesia and Intensive Care**

Project objectives

Pre-clinical medical students need an explicit connection between basic biomedical science and clinical medicine to reinforce their belief that biomedical science is the foundation of all specialties in clinical medicine. With the concept of strong linkage between biomedical science and clinical medicine, students will not lose their interest in clinical medicine while struggling to learn the anatomy and physiology in the pre-clinical year.

Activities, process and outcomes

We plan to transform the teaching of an existing course of Perspective of Medicine in Real Life (MEDU1150) to a flipped classroom teaching course including pre-class eLearning material, in-class simulation teaching using high fidelity simulators and post-class eLearning through the online electronic tutorial. Pre-class eLearning material related to cardiovascular, respiratory and body temperature control were designed and prepared, based on the pre-clinical teaching of Systemic Anatomy (MEDU1110) and Foundation Course for Health Sciences II (MEDF1012B). Matched simulation teaching (2 case scenario using high fidelity simulators and 2 live demonstration using volunteer students and real equipment) was designed. A trial run of the simulation teaching for a group of 6 MED2 students was performed in October 2021 with video recording. The simulation teaching for the whole year of MED1 students was initially scheduled in April 2022 and a revision concluding lecture scheduled in May 2022. However, the simulation teaching and lecture were postponed from April 2022 to 26-27 and 29 August 2022 due to the COVID-19 pandemic.

Deliverables and evaluation

Pre class eLearning material

1. Cardiovascular system
   - Illustration of the cardiovascular physiology
   - Illustration of the cardiovascular anatomy
2. Respiratory system
   - Illustration of the respiratory physiology
   - Illustration of the respiratory anatomy
3. Body temperature control
   - Illustration of the concept of core temperature and shell temperature

In-class face-to-face simulation

1. Live demonstration 1: blood pressure
2. Live demonstration 2: body temperature
3. Simulation 1: cardiac arrest
4. Simulation 2: anaphylaxis

Post-class eLearning

Annotated videos of the simulation teaching and liver demonstration to reiterate the physiological and anatomical concept.

The effectiveness of the new teaching material will be evaluated by the attendance rate and course evaluation of the existing biomedical science teaching, and students' examination result in those courses. Due to the postponement of the simulation teaching from April to August 2022, the evaluation plan was deferred. A trial

run of the simulation teaching for a group of 6 MED2 students was performed in Oct 2021 with video recording. The response from students who participated the new face-to-face simulation teaching/live demonstration is favorable.

Dissemination, diffusion and sharing of good practices

As the major component of the teaching project, face-to-face demonstration and simulation teaching has not been conducted, the details of the project were not disseminated yet. The outcome and developing process of the project will be presented as a poster presentation in local and regional medical education conference in the 4Q of 2022 and 1Q of 2023.

Impact on teaching and learning

If the possible responses from pre-clinical students persist, similar simulation teaching linking up basic science and clinical practice can be developed in other pre-clinical years.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Micro-Module Video Scenarios in Sensitive Communication Situations with Student Response Questions (Phase 2)**
Principal supervisors and unit:	**Dr. HWANG Shui Shan Isabel, School of Biomedical Sciences** **Dr. TANG Mei Kuen Florence, School of Biomedical Sciences**

Project objectives

The Communication Skills course (MEDF1031) is offered to over 350 first year undergraduate students in biomedical sciences, Chinese medicine, nursing, pharmacy, and public health programmes each year and it currently uses six micro-modules for teaching, learning, and assessment. These micro-modules provide situational scenarios to help students recognise the importance of effective communication in different healthcare settings. This Phase 2 project will add *two new micro-modules* in to teach students how to communicate effectively when offering '*genetic counselling*' and '*scientific data interpretation*'.

Activities, process and outcomes

Due to the social distancing constraints during the COVID-pandemic, we are only able to schedule physical student helper meetings to both rehearse and practise the scripts for video shooting in different venues. The video shooting of the first micro-module was successfully conducted on 20th May 2022. The site visit and video shooting for the second micro-module will be conducted in the CUHK Medical Centre on 8th and 16th June.

Deliverables and evaluation

Not available yet.

Dissemination, diffusion and sharing of good practices

Not available yet.

Impact on teaching and learning

Not available yet.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Online Psycho-educational & Mental Wellness Hub for Students in the Medical Field**
Principal supervisors and units:	**Dr. HWANG Shui Shan Isabel, School of Biomedical Sciences** **Ms. CHAN Tak Wai Winnie, Faculty of Medicine** **Ms. CHAN Ka Yee Cassie, Faculty of Medicine**

Project objectives

Our team believes that the quality and quantity of engagement and interaction between students and teachers is essential to students' mental and emotional health, and to their learning and professional identity formation. In this project, we will pilot a series of online psychoeducational seminars/workshops, assisted by e-assessment tools, to both strengthen student engagement and to identify students' needs during the ongoing period of social distancing. A series of psychoeducational seminars/workshops that were conducted last year by an experienced clinical psychologist will be re-packaged into a series of interactive micro-module videos and this free self-help website is named as ***e-hub***. This e-hub online platform houses a series of 10 micro-module videos that help students better understand themselves and learn strategies to cope with different types of stress that are common in the medical field:

MM1: Anger management > MM2: Comparison > MM3: Depression > MM4: Eating disorder > MM5: Exam anxiety > MM6: Grounding your stressful life MM7: Procrastination > MM8: Self-efficacy > MM9: Self-defeat > MM10: Sleep disturbance

Assisted with e-assessment tools, student users can also identity their mental health concerns and explore whether further assessment would be needed.

Activities, process and outcomes

As e-hub was just completed, major activities are focused on promoting this new online platform to all medical students from Year 1 to Year 6 through road shows, Faculty emails, and year orientation sessions between early September to November 2021.

Deliverables and evaluation

According to our small-scale online surveys (sample size =15) before launching this website to all medical students, we received a number of positive feedback from the student users which reflect that most of our outcomes can be achieved. They include:

- The MM videos helped to raise awareness on self-care
- The MM videos are informative
- The topics addressed are relevant to students' need
- The advices given are practical.
- The "lazy-bag" is a quick guide to the topic addressed
- The self-assessment tools helped me to gain understanding of my current mental state.

Dissemination, diffusion and sharing of good practices

The impact of e-hub will be concluded after we receive enough survey data by summer of 2022.
Our project has presented the creation of e-hub in the Teaching and Learning Innovation Expo 2021.

Impact on teaching and learning

The impact of e-hub will be concluded after we receive enough survey data by summer of 2022.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**The Challenges of Overcoming the Freshmen Difficulties in Learning**
Principal supervisor and unit:	**Dr. TANG Mei Kuen Florence, School of Biomedical Sciences**

Project objectives

The Biomedical Engineering Programme in the Faculty of Engineering is to train biomedical engineers to support the medical field to advance diagnostic tools and rehabilitation of postoperative progress. The School of Biomedical Sciences provides and contributes the teaching in core basic knowledge of human anatomy and physiology to the Biomedical Engineering Programme. Being university freshmen, Year one students of the Programme need to take time to adjust to the transition from secondary to university life and many of them are from very diverse educational backgrounds. In addition, students of the Programme are usually strong in learning physics and mathematics rather than biological sciences. The core course of Anatomy and Physiology makes it hard for them to learn and get a pass, since it requires memorisation to achieve good academic grading. In the project, our team explored and addressed the followings:

1. why physiology and anatomy are complicated for the students of biomedical engineering to learn;
2. how to support students in developing resilience overcoming the learning difficulty; and
3. what is the best strategic pedagogy that meets their learning needs in learning anatomy.

Activities, process and outcomes

Remote Activities	**Processes and Outcomes**
Using Polling mode after the lecture via the video conferencing system (VCS)	• In order to consolidate their understanding of new delivery content, the students were requested to answers conceptual questions before leaving Zoom.
Peers-to-Peers workshops in the non-teaching timetable	• In order to have full support for the needs of weak students, the 2-hr workshops have been held every Saturday morning starting from mid-January till the end of April 2021. • The attendance rates are low, and most students are weak in the learning process, including the international students.
Live Demonstration Practical Session via the video conferencing system (VCS)	
• View Plastinated specimen	• Besides of 3D scanning model for students to view the structures spatially, our team also arranged the live demonstrations of plastinated specimens via Zoom practical sessions.
• Peer-facilitators discussion in breakout room session	• We also arranged the peer discussion activity, which adopted the peers-assisted learning (PAL) format, in the Zoom practical after a live demonstration of the specimen to facilitate their understandings.
• Group Presentation	• Students applied their knowledge to evaluate what they learned during the practical session; they could also practise their writing and verbal skills.
Key project deliverables	**Processes and Outcomes**
• The Mobile App – eProfessional Study: Your Mobile Guide in Anatomy & Physiology (YoGap)	• We provide students with an interactive eLearning platform in the cognitive domain, ranging from understanding and memorisation to more advanced stages of application, analysis, feedback and integration with creation in their professional training.

• eProfessional study (ePS) in the "Anatomy & Physiology" Platform for the virtual elearning tools	• We provide students with a self-paced revision eLearning platform for their particular needs to control their learning progress in understanding and memorising learnt knowledge. (https://www.sbs.cuhk.edu.hk/undergraduate/eps/index.html).

Deliverables and evaluation

Our team has changed to use Zoom for the live demonstration practical sessions with peer discussion synchronously. Students' feedback has been sought concerning the remote teaching &learning activities, including the students' perception of the video conferencing system (VCS) and the peer-assisted learning approach (PAL) facilitating knowledge acquisition.

The progress of construction of the key project deliverables was entirely behind the timeline and have just been completed at the end of the project. The effectiveness will further be evaluated their effectiveness. All the feedback and comments on the pilot study of the usage of ePS are positive.

Dissemination, diffusion and sharing of good practices

The spreading of COVID-19 disrupted the daily practice of university pedagogy, and education sectors have adopted a gigantic transition in teaching and learning. Our institution has a new normal challenge in anatomy education, from the traditional way of observing plastinated specimens with explanation to the newly adopted Video Conferencing System (VCS) combined with peer-assisted learning (PAL) approach. The data analysis reveals that such an approach for overcoming the adverse situation in anatomy education improves and accommodates health profession training quality with the era of advanced technology amidst the sudden attack of COVID-19 spreading. Our team made alternative strategic pedagogical methods to relieve students' learning pressure in this core subject after understanding why this course is tough to study.

Impact on teaching and learning

The new online learning mode of anatomy demands face-to-face and traditional experiential learning, providing an excellent adjustment opportunity due to the outbreak of the COVID-19 pandemic and the implication of social distancing. The VCS-PAL approach would encourage active participation, raise questions and intellectual exchange between students and teaching staff, and receives good student perception feedback. It is the first step in modifying VCS learning. Further research on different topics, such as PAL efficiencies comparison between face-to-face and VCS, academic result comparison between conventional didactic lectures and PAL, etc., can also provide new insight. To conclude, the VCS-PAL of remote pedagogy surprisingly benefits teaching and could be a new normal of education in the future. We will explore more ways to serve the urgency with the educational perspective gap in continuing the training, enhancing practical skills and improving professional competency.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Virtual Clinical Ward Round in Respiratory Medicine: Case-based Learning Program for Medical and Pharmacy Students**
Principal supervisor and unit:	**Professor NG So Shan, Department of Medicine and Therapeutics**

Project objectives

The goal of this program is to promote student engagement and to cultivate skills of critical thinking in clinical respiratory medicine in which students are encouraged to integrate their learning in the context of authentic clinical scenarios via an interactive learning platform. Interprofessional education will also be enhanced with the sharing of learning materials focusing on diagnosing, monitoring and treatment between medical and pharmacy students.

Activities, process and outcomes

The activities included formulation of the details and materials of 4 common respiratory cases: (1) acute respiratory failure; (2) asthma; (3) pleural effusion; and (4) lung cancer. Clinical photos and videos of related procedures were collected. The clinical cases were drafted and presented in an interactive ways with multiple choice questions to test students' knowledge. Student helpers were recruited in the design and evaluation of the micromodules.

Deliverables and evaluation

- A total of 4 micromodules were finalized and uploaded to the Blackboard.
- These micromodules accomplished the project objectives which engaged students in the development of the course materials and enhanced interprofessional education with different faculties.
- Forty students participated as student helpers and helped the development of the micromodules and evaluation. Fifty-seven responses from the final year medical and pharmacy students were collected and 4 feedbacks were blank. Overall, there were 47% and 30% of responses strongly agree and agree to see these micromodule approach to be expanded to other courses respectively. Apart from the scores, students were also encouraged to give us feedbacks in their own words.

Dissemination, diffusion and sharing of good practices

The micromodules were uploaded to Blackboard on 13 July 2021. The project will be disseminated in the workshop/activities organized by the Centre for Learning Enhancement And Research (CLEAR) and educational seminars in the future.

Impact on teaching and learning

The general responses are excellent. The students are happy to follow the case and learn how to manage the patients.

THE CHINESE UNIVERSITY OF HONG KONG

Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Interactive Simulator of Clinical Teaching (ISCT) for the Assessment and Management of Medical Patients: A Clinical Scenario based Virtual Learning Platform for Medical Students**
Principal supervisor and unit:	**Professor YAN Ping Yen Bryan, Department of Medicine and Therapeutics**

Project objectives

Bedside teaching is the cornerstone of clinical medical education through which valuable history and physical examination skills, patient management, and the modelling of professional behaviours can be learnt via direct observation and hand-on participation. The current Coronary Virus Disease 2019 (COVID-19) pandemic has presented as a major challenge to clinical education due to the exclusion of medical students from traditional bedside teaching in an effort of minimize infection risk. In order to provide uninterrupted medical education in a safe environment, we propose to initiate a virtual interactive platform which comprises real-life cases of common medical conditions with real clinical signs such as heart rate, heart sound, breath sound, bowel sounds that can be accessed by the students remotely. Through this virtual platform, students can familiarise themselves with the clinical approach to real life cases, appreciate clinical signs, and learn about the management of common medical disease.

Activities, process and outcomes

4 commonly encountered medical conditions will be identified by the project supervisors. Real-life representative patients with these medical conditions will be selected. Relevant presenting history, physical finding and investigation result will be collected and compiled into a comprehensive case scenario. Multimedia resources such as auscultation physical signs including heart sounds, breath sound and bowel sound will be recorded using an electronic stethoscope with wireless recorder. Clinical photos and video will be collected in accordance with Hospital Authority guidelines. This multimedia information will be incorporated throughout the case scenario where appropriate. Relevant multiple-choice questions (MCQ) at level suitable for junior clinical clerkship (appropriating medical year 4 level) will be set at different stages of the case scenario. Explanation will be given for the answers. The clinical progress of the patients after treatment will be recorded for teaching purpose too. The interactive platform will be built using an online eLearning software and in consultation with Professor Vivian Lee from the Centre for Learning Enhancement And Research. Additional short case scenario will be added with relevant MCQs tagged if available. The course created with the online platform will be available even after the annual subscription expires.

By simulating traditional bedside teaching, students will be able to sharpen history taking skills, appreciate important clinical signs, learn to interpret relevant investigation, and develop critical thinking skills through this interactive learning platform. Students can also learn about the management of common medical problems and appreciate the evolution of the diseases through following up the progress of these patients.

Deliverables and evaluation

Volunteers from medical year 4-6 students were asked to test and assess the platform based on these 10 aspects using a 10 points scale on an online evaluation form. The 10 aspects are as follow:

1. Case complexity
2. Clarity of clinical information
3. Clarity of multimedia information
4. Clarity of instruction
5. Appropriateness of MCQ difficulty
6. Ease of usage of this learning platform
7. Usefulness of the clinical skills learnt

8. Similarity of this platform to bed-side teaching
9. Confidence in managing similar patients in real life
10. Overall learning experience using this platform

The overall response rate was fair. Among the 80 invitations sent out, 42 have responded. Of the responded, students found this platform easy to use with useful clinical skills obtained through using it. Although most of the students did not think that this platform can replace real-life bed-side teaching, the overall satisfaction rate was high with majority rating it 8 and 9 out of 10 points.

Dissemination, diffusion and sharing of good practices

This project is published on https://interactivesimulatorofclinicalteaching.000webhostapp.com. This project has been tested and evaluated by medical year 4 and 6 students. This platform is designed to be universal and can be expanded to cover other medical subspecialties and other specialties.

Impact on teaching and learning

This project facilitates the continuous medical education and clinical skills acquisition during the ongoing COVID-19 epidemic. It helps to overcome some of the restrictions over bedside teaching due to the need for infection control measures. Students can familiarize themselves with some of the common cardiac conditions using this virtual platform.

THE CHINESE UNIVERSITY OF HONG KONG

Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Enhancing Teaching of Gastroenterology through Innovative Interdisciplinary E-learning Platform**
Principal supervisor and unit:	**Professor MAK Wing Yan Joyce, Department of Medicine and Therapeutics**

Project objectives

Acute gastrointestinal bleeding is potentially life-threatening with high morbidity and mortality if not managed properly. Due to the COVID-19 outbreak, there is limited real-life exposure for medical students in managing this condition. Thus, we set up this eLearning platform with the aims to let medical students to:

1. Understand the causes of gastrointestinal bleeding
2. Identify important points in history taking and physical exam in patients with gastrointestinal bleeding
3. Learn the diagnosis and investigations for gastrointestinal bleeding
4. Identify and implement key points in resuscitation in patients with gastrointestinal bleeding
5. Learn the pharmacological and endoscopic management of upper gastrointestinal bleeding
6. Manage patients with variceal bleeding

Activities, process and outcomes

To achieve these objectives, a total of 8 videos (3 on clinical management of upper GI bleeding; 5 on endoscopic management of upper GI management) have been produced. Additional slides with key points on management of upper GI bleeding have been incorporated into the videos so as to consolidate students' knowledge. In the end of the module, there are 5 multiple choice questions to assess students' knowledge.

Deliverables and evaluation

The e-platform on the management of upper gastrointestinal bleeding has been established. Medical students will be evaluated on the knowledge of management of GI bleeding during their final exam. We have invited 8 students to evaluate the e-platform and all gave positive comments about the platform.

Dissemination, diffusion and sharing of good practices

A QR code has been set up and sent to medical students via email. We have also included the QR code in other lecture notes in Gastroenterology and Hepatology so as to promote the eLearning platform. The eLearning platform is now placed inside the BLACKBOARD system for students to review it when necessary.

Impact on teaching and learning

This eLearning platform provides us a chance to teach medical students about clinical and endoscopic management of upper GI bleeding outside medical ward and endoscopy center, and provide students with the experience of endoscopic management of GI bleeding. These valuable experiences will better equip our medical students for their future clinical practice.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Developing an Interactive Programme of Online Surgical Teaching in Ophthalmology for Medical Students**
Principal supervisor and unit:	**Professor CHAN Pui Man Poemen, Department of Ophthalmology and Visual Sciences**

Project objectives

1. to produce at least 15 surgical/laser/clinical ophthalmology procedure videos and create an online platform for the videos;
2. to run 4 workshops for medical students; and
3. to make 2 presentations (regional/international conference) and 1 workshop.

Activities, process and outcomes

Activities and process:

20 edited surgical videos are now available on our website https://master.dwh31b8mvezwm.amplifyapp.com/. 4 workshops were done for a total of 44 medical students during clinical attachment suspension. In addition, materials were utilized for 4 workshops/seminars for regional/international specialist ophthalmologists – a hospital Grand round, a microsurgical training workshop, a webinar training session for ORBIS (a charity group), and an invited lecture in Asia-Pacific Glaucoma congress (APGC).

Outcome:

Feedback from the audience was promising and reflected that the resources were helpful to supplement the canceled traditional surgical attachment during clinical teaching suspension.

Deliverables and evaluation

The teaching and learning processes within the programme will be evaluated as part of its ongoing development and as research into the evolution of architectural education through technology adoption. The 20 surgical videos are now available on the website for the public after registration https://master.dwh31b8mvezwm.amplifyapp.com/. The objectives were completed. Participants were satisfied with the course. We are preparing the abstract for CUHK Teaching and Learning Innovation ExPo 2022. The project also extended beyond the objectives with 4 workshops/seminars for specialist ophthalmologists (regional, mainland, and international). With this sustainable platform, we are seeking to create more courses with other charity groups (ORBIS).

Dissemination, diffusion and sharing of good practices

Apart from the above, we have set up "The innovative undergraduate education committee" in our department to adapt developing pedagogy in ophthalmology. The project deliverables were utilized for courses beyond undergraduate medical school teaching. We will share the experience with other departments for future collaboration (e.g. nursing, physiotherapist, surgery).

Impact on teaching and learning

A more comprehensive and standardized exposure of ophthalmology surgery can now be adopted in stress-free environment. Ophthalmologist trainees can learn the surgery on their own. The project also stimulated other possibilities, such as online surgical training sessions with charity groups that cater to less developed regions (e.g. ORBIS).

THE CHINESE UNIVERSITY OF HONG KONG

Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Sustaining Quality Medical Education in the face of COVID-19: Enhancement of the Current Student Learning Outcome (SLO) and Student Mapping Platform (SMP)**
Principal supervisor and unit:	**Professor ONG Michael Tim Yun, Department of Orthopaedics and Traumatology**

Project objectives

- With COVID-19, in order to maintain a quality education for medical students, there is an increasing need for online teaching.
- We have experience in delivering teaching materials online, with the SMP-I project 2009-12 and the SMP-II (TDG for 2012-15 Triennium).
- The SMP now requires major updating, which includes improving the navigation of the interface, updating of the content, as well as adding new features to enhance the engagement of students.

Activities, process and outcomes

Redesigning of SMP	New interface for easier navigation
Updating of content	New PowerPoints and Examination videos uploaded to the platform
Enhancement of student participation and engagement	>80% of students have recorded logins for the SMP with discussions
Questionnaires with positive feedback from students	>80% student with positive feedbacks via questionnaires
Number of downloads for Smartphone Apps	>80% of students downloaded the Apps

Deliverables and evaluation

The project outcome of redesigning the SMP is ongoing, and updating of the content is ongoing.

Dissemination, diffusion and sharing of good practices

This has been presented at the department meeting.

Impact on teaching and learning

Improved online learning for students with better preparation of lessons.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Developing E-Resources in Clinical Transcription for Speech-Language Therapy Students**
Principal supervisor and unit:	**Professor PEREIRA Valerie Jane, Department of Otorhinolaryngology, Head and Neck Surgery**

Project objectives

To develop e-resources for the (additional) study and practice of clinical phonetic transcription and to address the linguistic diversity in Hong Kong by including English and Cantonese clinical speech data for transcription practice.

Activities, process and outcomes

Development of video scripts and simulated clinical speech data in English and Cantonese; professional video production; baseline assessment of students' clinical transcription and assessment after launch of the videos; engagement of students in providing qualitative feedback.

Deliverables and evaluation

12 professionally produced videos (as set of 4 DVDs), instructions leaflet and a project leaflet. Statistical analyses show that watching the videos significantly improves student's clinical transcription scores in both English and Cantonese.

Dissemination, diffusion and sharing of good practices

The project findings will be disseminated to colleagues at CUHK. Lesson learnt and good practices will be shared with the other Speech Therapy programs in Hong Kong. The project was presented at the 2019 CUHK Teaching and Learning Innovation Expo and will be disseminated at upcoming speech therapy/clinical education conferences.

Impact on teaching and learning

The videos will be incorporated into the 'Speech Sound Disorders' 3-credit course as supplementary eLearning resources. This will have a positive impact in increasing accuracy of clinical transcription in students' clinical practicums and subsequent clinical management of Speech Sound Disorders in children.

THE CHINESE UNIVERSITY OF HONG KONG

Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Visualization of Clinical Psychiatry: Development of a Series of Annotated Online Teaching Videos on Mental State Examination**
Principal supervisor and unit:	**Professor WONG Wing Ho Oscar, Department of Psychiatry**

Project objectives

The project addresses to the educational needs of medical students during their clinical years, where exposure to a variety of clinical conditions is needed to equip the next-generation doctors. The present project aims at developing a series of clinical teaching videos to illustrate 4 major themes in psychiatry:

1. Acute disturbance of mental state;
2. Interface of psychiatry and other clinical specialties;
3. Rare but life-threatening psychiatric conditions; &
4. Effects and side effects of psychiatric treatment.

The clinical video will be disseminated through e-platform as educational materials for self-learning for medical students at CUHK.

Activities, process and outcomes

From a collection of clinical recordings of different psychiatric syndromes, senior medical students worked in partnership with the supervisors of this project in archiving and selecting suitable recordings as teaching materials. These recordings were augmented with annotations, voice-over and PowerPoint slides and built as 8 individual teaching videos that are to be used in the Year 5 Psychiatry Module of the MBChB programme.

Deliverables and evaluation

The indexed archive of clinical recordings was completed, and 8 teaching videos were produced.

Dissemination, diffusion and sharing of good practices

The 8 teaching videos will be disseminated to the prospective medical students from the academic year 2022-23 onwards during their Year 5 Psychiatry Module. The indexed archive will also be shared with the academic staff within the Department of Psychiatry.

Impact on teaching and learning

Formal evaluation to the teaching videos will be obtained from the academic year 2022-23 onwards.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Knowledge Transfer Network in Medical Humanities**
Principal supervisor and unit:	**Dr. NGAN Miu Yung Olivia, CUHK Centre for Bioethics**

Project objectives

The project objectives are (1) to foster a closer interrelationship between students and teachers in medicine and the humanities; (2) to apply classroom knowledge into actions; (3) to develop analytic thinking and promote ethical sensitivity in humanities; and (4) to be sensitised to everyday life experience and learn the subject.

Activities, process and outcomes

The project forms a student-oriented network involving three learning activities: practicum, newsletter, multimedia review, and promotional video.

Deliverables and evaluation

Two printed newsletters and two videos were produced. Student satisfaction in the learning process and video hit are potential performance indicators.

Dissemination, diffusion and sharing of good practices

The project outcomes were presented at an international conference co-hosted by the University of Malaya and the National University of Singapore. The presentation work received a merit award. The current project scale involved the medicine programme only. The team reviewed the feasibility and planned to extend the Newsletter Publication to the whole Faculty of Medicine, welcoming submissions from interdisciplinary departments, including the School of Biomedical Sciences, School of Chinese Medicine, School of Nursing, The Jockey Club School of Public Health and Primary Care, and School of Pharmacy. A similar mechanism involving a cross-disciplinary unit can be replicated at other Faculties. We will actively be seeking collaborators and hope to demonstrate good practice across the Faculty and the University.

Impact on teaching and learning

Medical humanities are central to clinical practice, where classroom teaching gears toward the cross-listing of societies into medical education. The current teaching framework provides limited experiential platforms inspiring students on how the acquisition of knowledge can apply to everyday life. This project addresses the teaching and learning needs outside the classroom.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Zoom-KEEP eLearning, Discussion and Assessment Platform for CMBI4001**
Principal supervisor and unit:	**Professor JIANG Liwen, School of Life Sciences**

Project objectives

In this project, we aimed to develop an integrated/interactive Zoom eLearning, discussion and assessment platform for CMBI4001/LSCI5601 "Protein Trafficking" with the following simulating components to help students (both UGs and RPGs) to adapt to this new teaching mode and to be better engage in the eLearning: (1) Complement with a KEEP (CU eLearning platform) Online Platform; (2) Discussion Time in Every Lecture; (3) In-Class Quiz; and (4) Presentations and Discussions.

Activities, process and outcomes

From September to October 2020, the Principal Supervisor (PS) has delivered 4 Zoom lectures. The Zoom lectures were supplemented with our previous developed flipped classroom on the KEEP Platform. The PS has also incorporated discussion session and in-class quiz in the Zoom lectures. Students were asked to present on specific topics by sharing their own PowerPoints on Zoom.

Deliverables and evaluation

The 4 Zoom lectures were recorded and developed into teaching videos. The videos were uploaded to the KEEP Platform of the course CMBI4001/LSCI5601 "Protein Trafficking" timely for student to revise the lecture contents.

The Zoom lectures resulted in a 100% attendance rate and good engagement of the students in the lecture discussion.

Dissemination, diffusion and sharing of good practices

We have shared our experience in the Teaching and Learning Innovation Expo jointly organized by the Centre for Learning Enhancement And Research (CLEAR) and Information Technology Services Centre (ITSC) in July 2021.

Impact on teaching and learning

During the pandemic and the sudden switch to a new mode of Zoom teaching, we are glad to see that our lectures delivered via Zoom maintain high quality that is comparable to face-to-face lectures. We believed that our project has address student learning needs and adopt innovative pedagogies for continuous teaching enhancement, which support the University Themes and fulfill the institutional strategic plan.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Interactive VR Tree Hunt Game for Flipped Learning**
Principal supervisor and unit:	**Dr. LAU Tai Wai David, School of Life Sciences**

Project objectives

1. To make good utilization of CUHK campus plants as teaching and learning materials through VR game-based learning program;
2. To enrich the traditional lectures by adding the new form of course assessment and flipped classroom activities;
3. To create two campus-based and one off-campus nature trails of different educational themes;
4. To enhance teaching and learning effectiveness in University with novel VR interactive quizzes and eLearning exercises;
5. To facilitate more active and interesting learning with interactive and challenging platform;
6. To be a backup teaching plan during class suspension period; and
7. To provide a pilot scheme of learning in the semester of Jan 2022 and to continue its operation for teaching enhancement in coming years.

Activities, process and outcomes

More than 30 plants species had been incorporated into the game-based VR online exercises of the three learning trails which included high resolution photographs, video of the three trails, aerial photos by 360o and droid cameras. Each exercise provided a total of 30 questions under 10 interactive hotspots for plant searching and identification with assessments. A pilot test run was carried out in April 2021 to collect the feedback from the course BIOL4510 "Hong Kong Flora and Vegetation" students. Based on the feedbacks, the interfaces and questions of the first exercise were improved. Further feedback-based modification was made in the other two exercises. All of the game exercise production was completed by May 2021.

Deliverables and evaluation

Three VR game-based learning trials with interactive VR Tree Hunt Games have been produced. (URL: https://syhuherbarium.sls.cuhk.edu.hk/Treehunt). They were designed with different learning themes and provide basic science information and career development thoughts for the undergraduate students. All of them are compatible to mobile VR experience technology. More than 70% of students (of BIOL courses) were found to have good understanding of 10 plants species and their related applications during pilot test period from April to September 2021.

Dissemination, diffusion and sharing of good practices

A poster presentation was given in the Teaching and Learning Innovation Expo 2021 which was organized by the Centre for Learning Enhancement And Research (CLEAR), Centre for eLearning Innovation and Technology (ELITE) and Information Technology Services Centre (ITSC) of CUHK. And the tree hunt game was presented to local primary and secondary school teachers in an Education seminar (organized by the Education Bureau and the Shiu-Ying Hu Herbarium) on 15 July 2021. All teachers and co-workers welcomed the new teaching software very much, more than 8 schools had participated in the further development of VR learning in their campus since then.

Impact on teaching and learning

Majority of students (e.g. BIOL 4510 "Hong Kong Flora and Vegetation") in the trial run enjoyed the new learning approach which resembles an adventure and had fun of playing game. The tree hunt game documented in our well-managed server could be adopted before and after lecture as a very effective flipped classroom. The software URL could be given to students for convenient learning, discussion and revision. Repeated usage

and learning would not cause extra burden to teachers and students, as no fresh materials or check points is required as in laboratory sessions. The VR game actually show the reality of the nature trails with the vegetation types and ecology. Users could experience very similar learning exposure as those in the nature. So the indoor learning method could supplement the students' learning experience even under bad weather or epidemic period. Frequently mixed up morphological and botanical terms have been discovered through the results of the in-game question set. More explanation and examples could be given in lecture to consolidate students' concepts learnt from playing the game. It is also definitely useful to direct students' understanding in botany to facilitate knowledge transfer and career opportunities.

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Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Using an Online-game-based Platform and Systemic Coaching to Teach the First-year Calculus Courses**
Principal supervisor and unit:	**Dr. WONG Chak Fu Jeff, Department of Mathematics**

Project objectives

- To build a competition, communication and cooperation online-game-based platform for studying first year Calculus courses and their related courses using visualization tools, symbolic solvers, chat box media and sound recording software
- To build a systemic coaching platform for three different roles: teacher, peer and learner using Person-Computer, Person-Computer-Person, Group-Computer-Group and Person-Computer-Group interaction approaches
- To use AI algorithms to discover students' learning habits and trace the success and failure of their problem-solving experience, and then redesign the problem sets using error-correction learning algorithms

Activities, process and outcomes

Activities

- Pre-Calculus – Two problem sets are given.
- Calculus at Game Play – One problem set is given.
- Calculus at Game Play – Online Learning of Differential/Integral Calculus – Five problem sets are given.

Process

1. Insert the following types of answers inside the box using a MATH calculator mode:
    - A mathematical expression
    - A numeric number
2. Complete multiple choice tests
3. Match items
4. Visualize the graph of the given function using GeoGebra as a graphical visualization aid
5. Select either TRUE or FALSE for a mathematical statement
6. Reorder/Reshuffle mathematical statements using a dragging button mode
7. Perform reciprocal marking using a check list clicking mode

Outcomes

Students can review basic knowledge of pre-calculus, improve their problem-solving skills, do drills with differential and integral calculus problems and their solutions and get used to Person-Computer-Person, Group-Computer-Group and Person-Computer-Group learning modes via different game play models. These models are Three Boxes Game, Spoof Game, Odd Even Game, Bluffing Game and Fibonacci Nim Game. Problem sets are designed using specific types of Mason's, Walsh and Satters's, and Sahin and Kulm's questions.

Deliverables and evaluation

Deliverables

Project website

- https://www.math.cuhk.edu.hk/~mathcal/mathgame/

- Pre-Calculus
- http://mathcal.math.cuhk.edu.hk:5000/Pre-calculus
- Calculus at Game Play
- http://mathcal.math.cuhk.edu.hk:5000/Calculus

- Calculus at Game Play – Online Learning of Differential/Integral Calculus
  - https://www.math.cuhk.edu.hk/~mathcal/mathgame/Unit31/
  - https://www.math.cuhk.edu.hk/~mathcal/mathgame/Unit32/
  - https://www.math.cuhk.edu.hk/~mathcal/mathgame/Unit33/
  - https://www.math.cuhk.edu.hk/~mathcal/mathgame/Unit34/
  - https://www.math.cuhk.edu.hk/~mathcal/mathgame/Unit35/

Dissemination, diffusion and sharing of good practices

We shared our pedagogical teaching experience at the International Conference on Learning and Teaching 2021 (ICLT2021) on 8 December 2021. We gave a 20-minute oral presentation entitled *Smart C3-based learning platform: Applying conceptual and procedural approaches and the three worlds of mathematics.*

We presented a night talk at Non-resident Hall – Liu Yi Tang at CUHK. We gave an hour-long oral presentation on 8 November 2021 entitled *Education? Entertainment? You are never too old to play!* This talk covered how to use the applications of game theory in Calculus learning and teaching.

We presented our pedagogical teaching experience at the Community of Practice Symposium of Education Innovation and Technology 2022 at CUHK, Hong Kong on 2 June 2022. We gave a 20-minute live oral presentation entitled *"An iterative model of the initiation-response-follow-up sequences in online Calculus teaching and learning".*

Impact on teaching and learning

Our aim is to support prospective teachers as they encourage the growth of students' mathematical thinking processes by having them solve problems based on Polya's four steps model, and Tall's three worlds of mathematics model and tools for questioning, e.g., Mason's, Walsh and Satters's, and Sahin and Kulm's questioning types. Teachers will use the C3 (communication, competition and cooperation)-based learning platform together with any mathematical thinking processes models that fit their needs and use them face-to-face in classrooms and in online teaching.

To create a teaching-learning interaction sphere, the eLearning platform presented here will provide students with a channel for swapping between C3 online-game-play learning modes. By acting in different roles, e.g., teacher, peer and learner, students are able to build their own mathematical thinking processes and use them for other topics, e.g., linear algebra and probability courses.

Moreover, after any math problems are solved, if students made any mistakes in their conceptual and procedural approaches, the platform uses a recommendation system to provide them with a set of specific problems designed to improve their skills. Hence students will learn from their mistakes and immediately see where they need to improve through a student-centered leaning approach and online discussion, learning and sharing strategies.

THE CHINESE UNIVERSITY OF HONG KONG

Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**E-mentors Hub for Data Science and Policy Studies Students**
Principal supervisor and unit:	**Professor WONG Wai Ho Wilson, Data Science and Policy Studies Programme, Faculty of Social Science** **Dr. CHAN Wai Yin, Data Science and Policy Studies Programme, Faculty of Social Science**

Project objectives

The project would establish an e-mentors hub for Data Science and Policy Studies Programme (DSPS) students to enhance their engagement in learning data science and public policy and address their learning needs, especially when face-to-face interaction is difficult during the pandemic period.

Activities, process and outcomes

This project consisted of DSPS mentors, scholars and DSPS students. Mentors, by building professional relationship with the students, helped students to identify and address their learning concerns, provided guidance for their learning action plan, analyzed students' strengths and weaknesses and provided constructive feedbacks.

Deliverables and evaluation

The project mainly organized three webinars. Themes of the webinars include making the transition from theory to practice in data science and policy studies, establishing a successful career in data science and policy studies such as in NGOs, and overseas experience of using data science in collaborative governance, regulation and other policy areas.

Dissemination, diffusion and sharing of good practices

The proposed project provided a teaching and learning model for other departments or CUHK in general, in particular on how to engage students in an e-mentorship programme. The e-mentors hub proposed by this project provides an effective channel, on top of the traditional in-class communication, to communicate and interact with students.

Impact on teaching and learning

The e-mentorship hub could supplement out-of-classroom exposure to students in order to enhance overall learning outcomes. Teachers have adopted the new practice inspired by this project to go beyond providing lectures to inviting honorable guests and professionals to share their life wisdom and experience. Additional workshops based on this model are also organized.

THE CHINESE UNIVERSITY OF HONG KONG

Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**Virtual Reality (VR) for Integrated 3-Dimensional eLearning, Making and Immersive Communications**
Principal supervisor and unit:	**Professor FINGRUT Adam, School of Architecture**

Project objectives

This proposal aimed to demonstrate how emerging VR technology is integral in the cultivation of design thinking through organizing a short series of workshops in the School of Architecture. The workshops expose participants to a process of discovery learning. Tools are introduced to students to stimulate an iterative design and problem-solving approach, where a cycle of action, observation, reflection, and reaction can occur. Exposure to these methods prepares students for their future careers in an increasingly technology-driven profession.

Activities, process and outcomes

Workshops are arranged over a period of 9 months that is open to students across the university. The workshops introduce VR tools and their incorporation into standard Architectural workflows that (1) SCAN and digitize the three-dimensional properties of objects; (2) DESIGN using digital and computational software with creative interventions; and (3) COMMUNICATE using virtual spaces along a web driven infrastructure for shared 3D experiences, virtual classrooms, and evaluation activities (pinups, presentations etc.)

The teaching and learning processes within the programme will be evaluated as part of its ongoing development and as research into the evolution of architectural education through technology adoption.

Deliverables and evaluation

The teaching and learning processes within the programme will be evaluated as part of its ongoing development and as research into the evolution of architectural education through technology adoption.

Dissemination, diffusion and sharing of good practices

Sharing took place through conference presentations and the submission of a manuscript to a peer reviewed journal (in review).

Impact on teaching and learning

The novelty effect was very high with students interested to explore new and top-of-the-line equipment that could integrate into their academic workflows.

More critical review of the interface and practicality of the system (for the generation of 3D models and communications from within the 3D environment) against the standard methods of computer screen, keyboard, and mouse is necessary. While the latter is realistically more streamlined to conventional practice, the VR headset and hand control interface will continue to become more intuitive as new tools and software arise. These alternative tools were also investigated by instructors, and students, and found to have their own potential benefits and drawbacks (interface, communications, compatibility etc.)

Most important is that engaging with VR and technology further enhances a broader set of skills related to digital literacy, computational tools, increased confidence with technology, engagement into a cyclical learning process (design thinking) and an understanding that technology is a conduit for exploration – not a final output device.

THE CHINESE UNIVERSITY OF HONG KONG

Special Funding Scheme to Enhance Student Engagement and Address Student Learning Needs supported by the Teaching Development and Language Enhancement Grant for 2019-22

Project title:	**SDGs Related Virtual Activities for Large Classes - Developing System Thinking in Zoom Learning Environment**
Principal supervisor and unit:	**Dr. LEE King Wa, Department of Sociology**

Project objectives

The project's three main objectives target students' **learning needs in the new normal**: First, to develop a range of replicable medium length (30mins to ~1 hour) **virtual activities** for teaching SDGs. Second, to demonstrate how **to simulate, in Zoom environment, the experiences** of (i) vulnerable groups targeted by SDGs (e.g. migrant worker); (ii) international conferences that promote SDGs (e.g. UNFCCC); and (iii) local council's decision-making process concerning specific SDGs (e.g. water privatization). Third, to apply the pedagogy of **situated learning** to enhance the necessary capability of system thinking among students through engaging them in sophisticated discussion and debate from multiple perspectives of system stakeholders concerning complex issues. Teaching outcomes include enhanced understanding of diversity, development of empathy, and acquisition of problem-solving skills for SDGs issues at global and local level.

Activities, process and outcomes

The project has developed seven medium length (30mins to 90mins) virtual class activities. The virtual activities invited students to engage in collaboration and deliberation to tackle a global challenge identified in the framework of the 17 UN SDGs. Students participated in role-playing by taking up the roles of stakeholders that were impacted by the global challenges. These roles include both decision makers, like government, corporates, non-government organizations, or employer of migrant workers, and vulnerable populations such as refugees, migrant domestic workers, farmers, households living in poverty, and coastal communities that depend on marine resources. Each of these roles have their own interests and agenda under the framework of the SDGs.

Deliverables and evaluation

- Enhanced class participation and engagement (students participated in the activities by taking turn to unmute and speak, sharing of screen for information, subsequently also more attentive to lecture content)
- Increase in attendance

Dissemination, diffusion and sharing of good practices

http://www.soc.cuhk.edu.hk/

Impact on teaching and learning

With the encouraging signs that students' attention and attendance have generally increased through the project period, the teachers of this project have planned to explore how to replicate this experience in the 'traditional' kind of sociology courses in 2022-23.