

Science education requires both understanding of principles and hands-on experience of the technical know-how that prompt students to apply the knowledge and logics to generate new scientific ideas. However, it is often a challenge to offer a laboratory course for classes with large number of students. This can be exemplified by the first year study in the broad-based science programme. BCHE2000 Frontiers in Biochemistry is an undergraduate course required for Biochemistry students. The course introduces different advanced topics in biochemistry. To facilitate the teaching effectiveness of the course, this MMCD project aims to develop a self-learning channel for students to grab the key concepts and research skills on 4 specific topics - RNA, metabolic diseases, stem cells and cancer.

Our team included a part-time research assistant and 10 senior year students major in Biochemistry. The student helpers were divided into 4 groups and each group worked on a specific topic. They also interviewed the respective teachers to ensure that the contents well align with the course syllabus. Their learning experience in BCHE2000 and in other senior courses was taken when we prepared the content of the micro-module, making this elearn platform student-oriented. The contact time for each topic is about 20-30 minutes, this includes an introduction, interactive timeline for major discoveries, virtual labs (RNAi, Uric acid assays, Immunostaining and Cell apoptosis) presented in animation format and a short exercise. Preliminary survey collected from a small focus group of 7 senior year students indicated that our objective was achieved satisfactory. They all agree that the teaching materials are clearly presented and easy to follow. Furthermore, the use of virtual laboratories demonstrates the key concepts and techniques and will be helpful for flipped classroom activities. Currently, we are fine tuning the content for the timeline, an animation for alternative splicing and the self-test. Our micro-module https://www.cuhk.edu.hk/culive/vlab_2018 will be released and be adopted by BCHE2000 in the second term of 2018/19.