

Project Title : Establishment of Ubiquitous Learning in Teaching and Learning Science for Knowledge Integration (Chemistry and Life Science)

Leading University : The Chinese University of Hong Kong

Participating UGC-funded University(ies) : The Hong Kong Polytechnic University

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Traditional single-discipline education is gradually facing the scientific and social challenges in the 21st century. Graduates from institutions of higher education are expected to possess multi-disciplinary knowledge and skills. The importance of this requirement is exemplified by the STEM education introduced by the Education Bureau in 2015. Furthermore, non-science major students can also be benefited from learning science concepts which can strengthen their learning and research in their own areas of expertise. However, the educational structure of academic organizations nowadays is usually planned based on academic disciplines.

With the support of eight science teachers with different expertise in teaching and learning development, a new paradigm of learning is to be explored and developed in this project to promote students to learn science across the boundaries of disciplines. This project focuses on ubiquitous learning to promote knowledge integration from different sub-disciplines in Chemistry and Biology. It also shows the connections between fundamental science concepts and the applications of scientific technologies in science and non-science situations. Ubiquitous learning emphasizes on instant learning in real-world. A vast number of learning objects in various media formats (video, photos, textual descriptions, and webpages) will be produced under six important themes in Chemistry and Biology. The learning objects will cover a wide range of contents including fundamental scientific concepts and phenomena, scientific information about materials and applications of scientific technologies in various

situations. The objects will be embedded into different learning pathways. It allows students to appreciate the connections between scientific concepts and applications.

Items related to the learning objects will be selected from teaching facilities and daily-life situations. QR code and RFID (radio-frequency identification) tags readable by mobile device will be put on these objects for students to access the relevant information instantly.

The learning materials will be hosted in a Learning Management System server for teachers and students to track the learning progress with mobile apps.