

THE EDUCATION UNIVERSITY OF HONG KONG
FACULTY OF LIBERAL ARTS AND SOCIAL SCIENCES

Research Impact/Knowledge Transfer Prize (IKTP)
for the Dean's Research Fund 2021/22

Brief Introduction of Awardee's

Research Impact/KT Publication/Output and Future Research Impact/KT Development

Awardee (Dept):	<u>Dr Leung Chi Hin, Assistant Professor (CCA)</u>
Publication Title / Research Impact / KT project:	<u>e-Orch Innovative Music Project</u>

A. *Briefly introduce your research impact/KT publication/output for which you have received the prize.*

The project is the first patented invention in the University and has successfully completed the commercialisation (Bulca, 2013) model. Research on iPad teaching and learning has been made under the funding of the Early Career Scheme from the Research Grant Council. The PI invented the Grid Notation based on the research finding and experiences and obtained the patent in Hong Kong (while the patent application in China is being approved) as intellectual property protection. The Grid Notation with the use of e-Orch won the Gold Medal from International Invention Innovation Competition in Canada, the Special Prize from the Romanian Inventors Forum, Bronze Medal from the International Trade Fair "Ideas – Inventions – New Products" in Nuremberg. EASE Fund awardee KreativLab has licensed the Grid Notation for commercial use, which transferred the knowledge further to schools and the community. The research scope is expanded with the increased users of the invention, and further research opportunities are generated. This inventive method of applying Grid Notation and e-Orch app are widely reported by various media.

The patented invention entitled "A System for Creating a Grid Notation Music Score" [R1] as a tool to lower the barrier of music score reading so that music learner can shorten the learning time comparing to the traditional five-line staff notation. The PI further applied the Grid Notation to develop a new iPadOS app, namely e-Orch [R6], to maximise the benefit of the invention for music teaching and learning. The app has built-in Grid Notation music scores with tailored interfaces and tools, namely Expression Grid, SmartKey, HexKey and SmartChord, to control various parameters such as pitch, rhythm, dynamic and articulation.

Leung published the "e-Orch Teaching Manual: Curriculum and Resources" [R2] in 2020 (1) to disseminate the research finding of his Early Career Scheme (ECS) to the education sectors; (2) to provide practical electronic orchestra (e-Orch) teaching design and resources to primary, secondary sectors and the community with the use of tablet device; (3) to demonstrate a comprehensive approach to e-Orch music notation – Grid Notation; (4) to provide a necessary technical setup plan of e-Orch; (5) to organise a professional seminar/workshop for in-service music teachers and community; and (6) to nurture a broader scope for future research.

With more schools using the teaching manual to curate innovative educational activities, the PI investigated the teacher efficacy under the e-Orch setting teaching and learning environment [R3] and presented the finding at the 12th and 13th Asia-Pacific Symposium for

Music Education Research and Apple Distinguished Educator Institute.

The project will not succeed without the artistic input to this new kind of musical genre. Non-traditional outputs of original music compositions were generated under the commissions from the Music Office of the Leisure and Cultural Services Department to explore the possibilities of e-Orch in music performance and the blending with traditional Chinese and Western instruments. The work, *The Ride of General Che for wujiatou and e-Orch* [R4], modernises traditional Guangdong music with granular synthesis techniques with live interaction among the instrumentalist and the e-Orch players. *Reimagining Kowloon City for percussion ensemble and e-Orch* [R5] captured the audio samples of Kowloon City and created the soundscape by the tablets in the e-Orch settings.

[R1]

Leung C. H. (2019). A System for Creating a Grid Notation Music Score (Hong Kong Patent No. HK1259119). HKSAR Intellectual Property Department.

[R2]

Leung, C. H. (2020). *e-Orch Teaching Manual: Curriculum and resources*. Hong Kong: Department of Cultural and Creative Arts, The Education University of Hong Kong.

[R3]

Leung, C. H. (2021). *Teacher Efficacy Under the e-Orch Setting Teaching and Learning Environment*. Presented at The 13th Asia-Pacific Symposium for Music Education Research, Tokyo.

[R4]

Leung, C.H. (2021). *The Ride of General Che for wujiatou and e-Orch in Guangdong music style*. Commissioned by Music Office. World première by the Music Office Chinese Ensemble and the EdUHK e-Orch in the concert MO Ensemble X e-Orch of the HK SciFest 2021. Hong Kong: Hong Kong Science Museum.

[R5]

Leung, C.H. (2021). *Reimagining Kowloon City for percussion ensemble and e-Orch*. Commissioned by Music Office. World première by the Music Office Percussion Ensemble and the EdUHK e-Orch in the concert MO Ensemble X e-Orch of the HK SciFest 2021. Hong Kong: Hong Kong Science Museum.

[R6]

Leung, C H. (2021). *e-Orch* (Version 1.1) [Mobile App]. Apple App Store. <https://apps.apple.com/app/e-orch/id1555654971>

B. *How you used/will use your prize and perhaps its usefulness to your research impact/KT development?*

The prize will mainly be used in hiring a research assistant to continue curating impactful e-Orch programmes/activities for schools and communities. The research result will be disseminated through conference papers or journal articles.

C. *Expected research impacts/KT outcomes/outputs arising from this prize.*

The upcoming research project tentatively entitled "Lowering the Barriers to Music-making: Investigating the Feasibility of Tablet Orchestra in the Teaching and Learning of Music Performance and Composition" will focus on the effectiveness of the Grid Notation. Leung will further collaborate with LCSD Office Music for the new project entitled "Art Tech School

Programme (Pilot Scheme) - Innovative Music Making: MO x e-Orch” to provide training of Grid Notation and teaching opportunities of e-Orch in schools. Both traditional and non-traditional outputs about e-Orch will be generated.