Development of Immersive-Virtual-Reality and Self-directed Pro-social Learning (IVRSPL) Environment to Promote Students' Pro-social Motivation and Behavior in Coding Classes

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Abstract:

There are increasing and exacerbating anti-social cases in Hong Kong, for example, bullying, aggressive

behaviors in recent social movements, cruelty to animals, as well as the declining average age of the

offenders concerned the Hong Kong society. However, the ethical and moral education is yet to fully

implement as intervention for ethical and pro-social behavior development. Being educators, we desperately

need to think out of the box to work on innovative educational interventions to promote students' pro-social

motivation and behavior, such as showing respect, empathy and compassion for others, and participating in

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voluntary actions that are intended to help or benefit another individual or group of individuals.

Existing literature has proposed several ways to promote pro-social motivation and behavior in the classroom

(e.g. Farrell et al., 2016; Carlo et al., 2018). Studies confirm that pro-social behavior, which can nurture

gratitude, kindness, and empathy in students, is positively correlated to students' school performance and

learning outcomes (e.g. Beachboard, 2019). Simultaneously, computing scholars have called for a

fundamental shift of coding education from computational thinking to computational action that coding

education should demonstrate the relevance of coding knowledge and skill to learners' lives, enable learners

to appreciate the purposes of coding, and see the opportunities to influence the people around them, benefit

the broader communities, and transform the world to become a better one (e.g. Tissenbaum et al., 2019; Bers

2020).

Therefore, in response to the call, this project proposes a new Immersive-Virtual-Reality based and Selfdirected

Pro-social Learning (IVRSPL) environment with immersive learning scenarios that could enable

students' visualization and interaction with the problem-based learning context involved in the coding

courses. The main purpose of the proposed IVRSPL learning environment is to stimulate students' pro-social

learning motivation, facilitate their self-directed learning process, and thereby enhance their pro-social

learning outcomes on the design and implementation of mobile applications and electronic engineering

systems for solving the self-identified problems of business and/or society, which is aligned with the idea of

computational action as aforementioned.

To our knowledge, there is no such research and teaching practice of providing IVRSPL environment in

coding courses, and examining its effects on students' pro-social motivation and behavior from the

perspective of the affective domain of learning outcomes. Also, this approach aligns with the CityU's

blueprint of discovery-enriched curriculum, and also synergizes inter-departmental collaboration amongst IS,

EE, OCIO and EDGE. The output of this project is potentially applicable to all other related coding courses

and for all CityU students, while the research findings of this project have potential to be published in top-tier

journals.