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香港城市大學
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Blockchain for Peer-Assisted Learning

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Abstract:

In this project, we propose to develop a blockchain application that encourages peer assisted learning (PAL). PAL is in two forms: (1) help seeking and peer assistance, and (2) revision exercise creation and evaluation of the exercise. PAL is a decentralized student activities with little or no instruction intervention. For (1), students actively ask questions they do not understand and provide answers to question seekers. To provide peer assistance, students should have a good command of knowledge of existing course subject. PAL can motivate students to be more proactive in learning and understand the course subject if they want to provide valuable assistance to their peers. According to Bloom's revised taxonomy of learning, such activities can enhance students' "understanding" of course subject. For (2), it is actually a more advanced behavior of PAL and in Bloom's revised taxonomy of learning, related activities are classified as "creation" of related knowledge. By creating revision exercises for the peers, the students should not just fully "understand" the course subject, but able to disseminate related knowledge and assess others. Furthermore, by evaluating the revision exercises created by others, students apply skills such as "analyze" and "evaluate" in Bloom's revised taxonomy of learning. In summary PAL can motivate students to learn the course subject in better ways. One challenge to stimulate PAL is the lack of incentives and fair system that can reward students for their proactive PAL behaviors. Taking the advantages of traceability, transparency, decentralization, and non-refutability, we propose to develop a blockchain application that can achieve the goal. First, students' PAL activities are visible to all participants, which is the transparency characteristic of blockchain. Second, students can be rewarded by virtual points for their PAL behaviors, which is the traceability characteristic of blockchain. Third, students' PAL activities are completely voluntary with little intervention from instructors, which is the decentralization characteristic of blockchain. With the help of gamification, students can be motivated to engage in PAL activities. Finally, students' activities



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on our proposed application will be safely recorded and translated to corresponding virtual points. Such points cannot be moderated by instructors or peers, which is the non-refutability of blockchain, and we can guarantee a fair and transparent system to all students. Because the proposed application is scalable, it is suitable for large class learning in online environments. Because students' participation on course materials is recorded by the application securely and fairly, the virtual points can be used as a reference points for instructors to determine class participation scores of large classes.