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Introducing play-based learning and custom animated experimental demos to a course on nucleic acids: turning lectures into interactive game and discussion sessions

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Abstract:

In this project, I will introduce play-based learning and interactive experimental demos to a course on nucleic acids using innovative game-styled software and video-guided interactive teaching-learning methodology, which will significantly improve the teaching and learning experience of the nucleic acid course CHEM3081 Chemical Biology of DNA and RNA. This course is being offered annually to approximately 40 undergraduate students, including those majoring in Chemistry and enrolling in the new Global Research Enrichment and Technopreneurship (GREAT) stream. This teaching initiative is novel and can also be applied to other courses, making this generally applicable and transferrable. Current teaching in nucleic acids lacks instant feedback exercises and hands-on activity on materials being taught in lectures, causing a steep learning curve. This project will enable the students to have direct and regular engagement with the course leader and classmates on the materials being taught with the state-of-the-art online game-based teaching platform Kahoot, to better understand the ins and outs of nucleic acids, and interact with classmates and course leader instantly in class. The answers/scores recorded can also be used to design focused-study tutorial sessions and a part of the continuous assessments for the course. In addition, interactive experimental demos will be prepared by the course leader to supplement the understanding of the content taught in the lecture. This will bridge the large gap between the conceptually understanding and practical familiarity of the experiment. Overall, the content and narrative will custom to fit well with the CHEM3081 course, which will stimulate the students to have stronger motivation and comprehensive understanding, as learning through playing, and visual demos are well documented to enhance the level of engagement, discussion, and learning incentives, not to mention that students can remember the concepts and critical points in the lectures easier. These 2 new activities are original and will be able to promote students, especially those digitally native, generation Z students' interest and discovery sense in nucleic acids and science at large.