ChatGPT, Academic Integrity and Problem Set Development in Economics Subject

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Abstract

Economics subjects extensively adopt problem sets as a key continuous assessment (CA) component. In an economics subject offered at The Hong Kong Polytechnic University, there are 7 problem sets with total 28 questions assigned to students for group presentation (10% of total marks) and individual assignment (15% of total marks). Since the University opens door for Generative Artificial Intelligence (GenAI) tools like ChatGPT, students' easy access may prompt academic dishonesty behaviors, thus contradicting PolyU's stance on AI: "PolyU takes an open and forwardlooking stance on […] ChatGPT […] upholds the principle that students must adhere to high standards of academic integrity in all forms of assessments." The problem-set questions can be categorized to (i) discussions (e.g., analyzing an event's impact on the market), (ii) calculations (e.g., finding equilibrium price and quantity), and (iii) graphical illustrations (e.g., finding the triangle of a consumer surplus with the aid of a diagram). (i) may involve diagram construction but is way more writing-intensive and interpretation-focused compared with (iii). We reasonably postulate that the performance of ChatGPT in obtaining a good answer depends on the nature of questions. We thus provide empirical evidence on ChatGPT's performance in the three types of questions while identifying potential risk of academic dishonesty in teaching and learning activities. We use students' individual assignment submissions to conduct a question-by-question comparison of the similarity index against the ChatGPT source that we feed into *Turnitin*. We find that the comparison will corroborate our findings on ChatGPT's performance in attempting those questions. The result is justified by: (a) we choose a subject for engineering students, who are more skilled in using IT tools; (b) a large sample size (N>100); and (c) the problem sets are unevenly distributed, some comprise more calculation questions, thereby giving rise to students' concern over fairness.

Keywords: ChatGPT, Academic Integrity, Problem Set, Economics