

Given a repository of questions mapped to intended learning outcomes(ILOs) the generation of an exam by choosing a set of questions out of the repository is another crucial task for educators. An exam generation based on Bloom’s taxonomy from a repository of questions randomly is mentioned in [Amria et al.(2018)Amria, Ewais, and Hodrob].

A rather more control approach is provided in [Chow et al.(2024)Chow, Lee, Park, Kuruppum where adaptive cruise control algorithm is adopted to adjust the accomplishment of students to the study material goal in terms of ILOs from a repository of questions instead of choosing questions from the repository randomly. A survey is applied to the student beforehand and the instructor is assisted via the so called iPRACTISE system.

The use of personalized practice quizzes utilizing the STACK framework has been documented for advanced mathematics relevant to control engineering, focusing on topics such as the Solution of the Euler-Lagrange differential equation in [Erskine and Mestel(2018)]. The exercises are staged into questions to provide feedback on early parts of the calculation before students proceed to the final, more complex steps.

References

- [Amria et al.(2018)Amria, Ewais, and Hodrob] Amria, A., Ewais, A., and Hodrob, R. (2018). A framework for automatic exam generation based on intended learning outcomes. *CSEDU (1)*, 2, 474–80.
- [Chow et al.(2024)Chow, Lee, Park, Kuruppumullage Don, Hammel, Hallquist, Nord, Oravecz, F Chow, S.M., Lee, J., Park, J., Kuruppumullage Don, P., Hammel, T., Hallquist, M.N., Nord, E.A., Oravecz, Z., Perry, H.L., Lesser, L.M., et al. (2024). Personalized education through individualized pathways and resources to adaptive control theory-inspired scientific education (ipractise): proof-of-concept studies for designing and evaluating personalized education. *Journal of Statistics and Data Science Education*, 32(2), 174–187.
- [Erskine and Mestel(2018)] Erskine, G. and Mestel, B. (2018). Developing stack practice questions for the mathematics masters programme at the open university. *MSOR Connections*, 17(1).