

participants who put less effort into the task. This speaks directly to the importance of motivation, effort and/or diligence and that we can develop ways of measuring this from time-stamps data in the performance logs.

We learned that the advance criteria used for adaptive jumping or branching need to be calibrated to the learning population. Only 7% of the History subjects earned a jump, while 90% did so in Statistics. About 47% jumped in Classical and that was the desired result. DeckChair Tutor was built in part to be able to automate curriculum design research by varying threshold option across different groups of students, and evaluate optimal jump criteria.

We compared traditional multiple-choice questions with more complex question types and found that both speed and accuracy improve for both from pre-test to post-tests, with few exceptions. There were much bigger speed improvements for the complex items, which represent composite tasks and we argue that this provides more opportunity for students to see improvement in speed (and therefore their SkillScore). Other research could address the motivational and academic benefits or costs of gameifying the tasks with SkillScore-related badges or certificates.

Very strong correlations were found between our fluency measures (critical time, and SkillScore) and midterm and exam grades in the course. In multiple regressions, BOTH SkillScore and critical time independently account for up to 50% of the variance in the final exam scores. In the simple correlations, critical times predict the final exam grade better than accuracy scores. The best predictors do seem to vary for the two question types: for multiple-choice items (MC) critical time is better than accuracy, and for QuickFire (QF) or multiple-fill-in-the-blank (MFB) items, accuracy is better than critical time.

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11. References

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