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Examining the relationships between attendance, online engagement and summative examinations performance

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Background:

Non-attendance at lectures and tutorials is recognised as having a detrimental effect on subsequent examination performance in undergraduate students¹. There can be many reasons for non-attendance^{1,2} and care must be taken to discover the root cause in individuals, as a simplistic approach of making attendance mandatory without additional student supports being provided may be ineffectual³.

Monitoring of attendance may be problematic; traditional manual methods are time-consuming, particularly with increasing student numbers, and recording errors are difficult to entirely eliminate⁴. Automated capturing of online activity may be a more time-efficient manner of identifying struggling students at an early stage, allowing specific interventions and supports to be put in place as appropriate.

Aims:

- To determine whether online indices of engagement and/or physical attendance records correlate with summative examination performance.
- To identify predictors of performance to allow early intervention with at-risk students in the future

Summary of work:

This research is part of a prospective study examining physical attendance, online activity reports (Moodle), continuous assessments and summative examination performance. Ethical approval was granted by RCSI Ethics Committee. Two consecutive modules within the first year of the undergraduate medical program were identified for inclusion.; Neuromuscular (NM) and Alimentary System (AS). The following data were collected:

- Physical attendance
 - ❖ Small group teaching sessions (8 NM & 12 AS).
- Online activity
 - ❖ Lecture notes viewed within 28 days of lecture (25 NM & 28 AS)
- Continuous assessment performance
 - ❖ Formative vivas & written MCQ quizzes
- Summative examination performance
 - ❖ NB – corrected for continuous assessment component

All data were anonymised, and then analysed with IBM® SPSS® Statistics 20.

References:

1. Massingham P, Herrington T. Does attendance matter? An examination of student attitudes, participation, performance and attendance. Journal of university teaching & learning practice. 2006;3(2):3.
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3. Rodgers JR. Encouraging tutorial attendance at university did not improve performance. Australian Economic Papers. 2002;41(3):255-66.
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Results:

A single cohort of 365 students undertook both the NM and AS modules, 30 of whom were repeating. Comparison of medians showed significant reductions in all parameters within the repeat student group ($p < 0.005$ for all, Mann-Whitney U; Table1).

		Physical attendance	Online activity	Continuous assessment	Summative examination
NM	1 st - time	8	25	2.8%	63.0 %
	Repeat	7	17.5	2.2%	53.8 %
AS	1 st - time	12	26	2.8%	66.3 %
	Repeat	8	19	2.2%	54.4 %

Table 1. Descriptive statistics

Initial diagnostics were then performed, confirming basic assumptions prior to regression analysis; all parameters were significantly correlated with summative performance, and formal tests for tolerance and variance inflation factor (VIF) showed no evidence of multicollinearity.

In NM, analysis showed that continuous assessment had the largest effect size on summative examinations for both first-time and repeat student groups ($R^2 = 0.545$; $R^2 = 0.289$). Among repeat students, online access of lecture had a larger effect size than physical attendance at small group tutorials, while both these indices were less contributory ($R^2 < 0.1$) for first-time students (Table 2).

Within AS, continuous assessment showed the largest effect size for first-time students ($R^2 = 0.585$), while online access of lecture notes was most contributory among repeat students ($R^2 = 0.35$; Table 2).

		Physical attendance	Online activity	Continuous assessment
NM	1 st - time	$R^2 < 0.1$	$R^2 < 0.1$	$R^2 = 0.545$
	Repeat	$R^2 < 0.1$	$R^2 = 0.16$	$R^2 = 0.289$
AS	1 st - time	$R^2 = 0.11$	$R^2 < 0.1$	$R^2 = 0.585$
	Repeat	$R^2 = 0.23$	$R^2 = 0.35$	$R^2 = 0.289$

Table 2. Predictors of summative examination performance

Discussion:

Effect sizes are most notable for continuous assessment, but online activity correlates with summative performance and is more predictive for outcomes among repeat students than physical attendance. These indices may be useful to screen at-risk students for individual intervention and support.