The impact of student attendance on assessment specific performance in sport degree programs

Title: The Impact of Student Attendance on Assessment Specific Performance in Sport Degree Programs

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ABSTRACT

This study aimed to assess the relationship between attendance and module assessment performance across three Sport degree programs. Undergraduate students (n=256) from three level 4 sport degrees (Sport Therapy (ST): 83; Sport and Exercise Sciences (SES): 80; Sports Development and Management and Coaching (SDMC): 93) participated in this 12-week prospective study. The assessments consisted of a practical for ST, exams and laboratory reports for SES, and presentations and essays for SDMC. A significant correlation was identified for attendance and overall performance across all degrees, although this was weak (r_s= 0.327, p <0.001). These findings suggest attendance positively correlates with assessment performance. All assessment types significantly and positively correlated with assessment performance. The study also reports that regardless of assessment type, attendance over a threshold of over 75% led to significantly higher assessment performance compared to those that did not achieve this threshold.

Key words: higher education, pedagogy, evaluation, undergraduate

INTRODUCTION

The landscape of Higher Education (HE) has continued to change over the last decade with applications continuing to rise in the UK, despite the increase in tuition fees in 2012. The total number of applicants to UK universities rose from 589,750 to 626,360 between the years 2013 and 2016 (UCAS, 2017). Brennan, Durazzi and Tanguy (2013) outline that HE aims to disseminate and advance knowledge through teaching and learning. A factor that may compromise this impact of HE is attendance, which has been implicated to hamper assessment performance and overall student engagement (Gbadamosi, 2015). There has been a growing view in HE as a result that student attendance is a concern (Massingham and Herrington, 2006). It is thought that student attendance is central to student performance and is likely to increase their chances of fulfilling their academic potential when they attend consistently (Durden and Ellis, 1995). Furthermore, with the recent developments within the Teaching Excellence Framework (TEF), lecturers, guided by institutional policy have a responsibility to ensure engagement with modular activity and this will be criteria for assessment.

Attendance in lectures and seminars are considered important as they contribute to the transition from surface learners (through secondary school and further education) to deep learning in HE (Donnison and Perry-Edwards, 2012). It is claimed that through frequent absenteeism students find it difficult to build the necessary skills and knowledge required to succeed in their chosen area of study (Aden, Yahye and Dahir, 2013). Indeed, many UK HE institutions implement attendance regulations that are typically outlined in the Module Handbook or student contract. For example, these regulations may specify that two consecutively missed sessions will result in a meeting to monitor progress. Furthermore, in some cases students who fail to attend at least 75% of the sessions provided, regardless of grade outcome, may be required to repeat the module in the following year. It is worth noting, however, there is no consistency in UK HE institutions and attendance monitoring, but these processes clearly have implications on student progression in their degree program. Nonetheless, it also outlines the importance which universities now attach to attendance and is perhaps guided by the findings of recent studies which have found student attendance impacts upon student performance (Durden and Ellis, 1995; Stanca, 2006; Gottfried, 2010).

A study by Gottfried (2010) supported the link between attendance and achievement displaying a positive and statistically significant regression (R^2 0.40, $p < 0.001$), though this was in elementary and middle school students. Interestingly, whilst Durden and Ellis (1995) found

that higher attenders achieve better course grade averages, the effect was nonlinear suggesting some high attenders do not necessarily achieve a high assessment grade, and vice versa. Their evidence suggested that the academic achievement of students was only hampered for those who missed in excess of four classes across the semester. The authors therefore suggested that a 'threshold effect' was present meaning students could afford to miss up to four sessions before their assessment performance were negatively affected. This perhaps justifies the common use of attendance thresholds at HE institutions in the UK, including the 75% threshold enforced at Edge Hill University, for example. A difficulty of quantifying the relationship of attendance on assessment performance is that the type of assessment (i.e. exam, laboratory report, essay and practical) is seldom considered, which plausibly can have an effect on the overall relationship.

Stanca (2006) found that student attendance at both lectures and classes/seminars, which is perhaps important in a HE context, had a significant impact on performance of an exam assessment. Deane and Murphy (2013) progressed this by investigating whether undergraduate student attendance impacted upon an overall assessment score, comprising results from a multiple-choice exam, six short-answer questions, and an oral examination. They discovered that attendance significantly impacted upon final grades, with distinction grades being awarded in isolation to those who achieved attendance of at least 80%. Moreover, the majority (60%) of students who failed to achieve a pass grade were those who attended less than 80% of the sessions provided. This adds support to the 'threshold effect' proposed by Durden and Ellis (1995), although Deane and Murphy (2013) sample comprised of medical students and little is known as to whether this effect is present in sport students. Furthermore, whilst these results indicate that attendance can impact the results of a final grade comprising of results from a variety of assessments, there appeared to be no effect between the assessments investigated. Despite no effect between the different types of assessment in the analysis by Deane and Murphy (2013), a study by Furnham et al. (2007) did display students from British and American universities preferred a multiple-choice exam compared to other types of assessment (timed written paper, oral examination, continuous assessment, dissertation or group work). This relationship was also observed in a similar study (Chamorro-Premuzic et al., 2005) within a group of Australian undergraduates. Yet, students also reported that a multiple-choice exam was not a true reflection of their ability.

One suggestion for a bias towards multiple-choice exam assessments is that students are only required to adopt surface learning, with those who adopt a deep learning strategy being at a disadvantage (Scouller, 1998). Furthermore, the previous experience of students exposure to education in secondary school and further education is arguably largely indicative of a surface learning approach, resulting in an under-development of deep learning; leading some to even question if this was even initiated (Donnison and Perry-Edwards, 2012). Nevertheless, students who adopt a deep learning strategy typically perform better in essay type assessments which are perceived as assessing higher levels of cognitive processing and are integral to success in the latter years of an undergraduate degree (Scouller, 1998). Furnham et al. (2008) revealed that those students who preferred multiple-choice exam assessments were commonly surface learners, whilst deep learners were in favour of essay style assessments such as final dissertations. It is unclear how student attendance relates to this however, if at all. Some have suggested that students are only interested in attending to ensure they obtain sufficient information to assist them with their assessments and exam questions (Murphy, 1998; Browne and Race, 2002; Exley and Dennick, 2004). Despite this, little is known in relation to how this attendance relates to student performance across the different type of assessments performed, particularly in Sport and Exercise Science.

Whilst factors such as self-efficacy have been examined in relation to its impacts on student performance on sport degree programs (Lane, Hall and Lane , 2004), few have examined the relationship between attendance and student assessment performance in these degree programs. The aim of the current study is to, therefore, investigate the relationship of student attendance on overall assessment performance across a combination first year sport degree modules including Introduction to Anatomy and Physiology in ST, Introduction to Sport Policy and Development in SDMC and lastly, Physiology and Nutrition in SES. A secondary aim of this study is to investigate how overall attendance influences assessment performance of specific assessments, namely: multiple-choice exam, essay, individual presentation, laboratory report, and practical exam. Finally, the current study will look to understand whether there is a ‘threshold effect’ in relation to overall attendance and sport students assessment performance, in line with institutional policy.

METHODS

Setting

This was a prospective cohort study which was conducted within a UK based HE institution. All students were enrolled students on a Sports based degree on a full-time basis for three years at the time of the study data collection (2016). All degree types in used in the study were Bachelor of Science degrees (BSc). This entailed attendance to 24 sessions across 12 weeks and two examinations in each respective module. Each session entailed a two-hour lecture (1 session) and a one hour seminar/workshop (1 session). A hard copy of lecture slides is only provided during the lecture and are not recorded or online until after the lecture in order to encourage attendance. There is also a requirement of all the students on this program to attend at least 75% of sessions. The second assessment was excluded from ST on the grounds it was the same type of assessment in SES (i.e. exam).

Participants

Ethical approval for the present study was initially obtained from the University Research Ethics Committee. Attendance and assessment performance data for ST, SES and SDMC level 4 students during the 2016-17 academic year was obtained from the Department. Students were first year full-time undergraduates of a three year degree program. All personal and student demographics were removed prior to statistical analysis for participant confidentiality. The inclusion criteria of this present study required all students to complete the specific module assessments, and were registered for the entire 12 weeks that the module was delivered. Any students who did not meet these criteria were removed from the analysis.

Data Collection

Student attendance was calculated from a paper-based log-book that the students complete at the commencement of each session. This was then transferred into an online log-system used by the Department to monitor attendance. All data for grade performance was obtained subsequent to publishing all module grades and was obtained from the Department. To identify the assessment specific relationships with attendance, all degree programs included in the present study were all different summative assessments. Specifically, these included a practical assessment for ST, laboratory report and written examination for SES and presentations and essays for SPMC. The overall performance from ST, SES and SDMC were also included for analysis. The written examination for SES was primarily multiple-choice questions and a small number of short answer questions and labelling diagrams.

Statistical Analysis

Assessment and attendance data were initially inputted into Microsoft Office Excel, where all data were represented as a percentage on a 100-point scale. Descriptive statistics were used to describe the student population, student attendance and academic performance (i.e. mean, median, standard deviation, interquartile range). Normality was assess using the Shapiro-Wilk statistic, where the assumptions with normality were violated for attendance ($p = 0.045$) and performance in assessments ($p < 0.001$). Therefore, Spearman's rank correlation was used to identify the relationship (r_s) between overall attendance and overall assessment performance across all degree programs, and the specific assessment types within the degree program. The strength of the relationships were categorised as very week (0.00-0.19), weak (0.20-0.39), moderate (0.40-0.59), strong (0.60-0.79) and very strong (0.80-1.00) (Hopkins, 2000). To determine whether the 75% attendance metric affects assessment performance, a Kruskal-Wallis H test was used to identify differences between students with low attendance (<75%) and high attendance (≥ 75%). All assumptions associated with the aforementioned statistical tests were not violated. Specifically, initial analysis identified the relationship was monotonic, assessed by visual inspection of a scatterplot from the Spearman's rank correlation. For the Kruskal-Wallis H test, the distributions of the attendance values were comparable for both groups as identified by visual inspection of a boxplot. All statistical analyses were completed using PASW Statistics Editor 22.0 for windows (SPSS Inc, Chicago, USA). Statistical significance was set at $p \leq 0.05$. All data is reported as mean ± standard deviation (SD) unless otherwise stated (median and interquartile range [IQR]).

RESULTS

Descriptive Analysis

A total of 256 students from three level 4 sport degrees (ST: 83; SES: 80; SDMC: 93) that completed all module assessments for the specific degree program were included for further analysis in this study (Table 1). The study sample included low attenders (<75% n= 81) and high attenders (≥75%; n = 175). Table 1 present the mean and SD of overall attendance and performance with addition to assessment specific performance. Overall, the ST students achieved the highest attendance and performance values compared to the other two modules included in this study.

Table 1 near here

Correlation

All correlations were significant and positive. For overall attendance and overall performance across the degree programs, a significant correlation was identified (r_s= 0.327, p <0.001; Figure 1). When this analysis was considered for the specific type of degree and assessment, the relationship for ST degree program, overall attendance and practical performance was also significantly correlated (r_s= 0.277, p = 0.011). For the SES degree program, overall attendance was significantly correlated with laboratory reports (r_s= 0.467, p <0.001) and exam performance (r_s= 0.508, p <0.001). For the SDMC Degree program, overall attendance was significantly correlated with presentation performance (r_s= 0.415, p <0.001) and essay performance (r_s= 0.441, p <0.001).

Figure 1 near here

Attendance Based Performance

A significant difference was identified by the Kruskal-Wallis H test (X^2 (1) = 10.33, p = 0.001) between low attenders (<75% n= 81; Median = 48, IQR 15%) and high attenders (≥75%; n= 175; Median = 55, IQR 21%) was observed for overall module performance across all degree types (Figure 2).

Figure 2 near here

DISCUSSION

This study primarily aimed to investigate if student attendance correlates with assessment performance within first year sport undergraduate degree programs. A second aim of this study was to investigate the attendance-assessment relationship upon distinguishing between different types of assessment. Lastly, the study also investigated the importance of an attendance threshold of at least 75%, as this was the attendance policy adopted by the institution used in the study. The primary finding was that attendance positively and significantly correlates with assessment performance in all types of assessment, albeit with a weak relationship and one that is non-linear. Upon separating for degree type and assessment type however, attendance showed a greater positive relationship with assessment performance in SES degree programs completing exam and laboratory reported assessments. This relationship was stronger (moderate relationship in both assessments) compared to ST completing practical assessments (weak relationship). Whereas, SDMC who completed individual presentations and essays displayed similar correlations to SES, although they were marginally weaker. A unique

finding of this study was that attendance greater than 75% resulted in significantly higher assessment performance compared to those who attended less than this threshold of sessions across all Sport degree programs, akin to findings in other research investigating medical undergraduate students (Durden and Ellis, 1995).

Overall attendance – assessment performance relationship

The relationship between attendance and overall assessment performance is weaker than some (Aden et al., 2013; Deane and Murphy, 2013; Cohall and Skeete, 2012) but not all previous research (Horton et al., 2012; Gatherer and Manning, 1998; Riggs and Blanco, 1994). Aden et al. (2013) for instance, reported a strong positive correlation between attendance and assessment performance ($r = 0.72$, $p < 0.001$) within a group of undergraduate Business and Accounting students within a Somalian institution. In contrast, the present study revealed only a weak relationship across all degree programs considered in this study. Likely factors to explain the differences are the institutional location (Somalia vs. UK) and degree courses being investigated (Business and Accounting vs. Sport Sciences). The findings from the University of Dublin, which shares United Kingdom (UK) educational policy were more similar to the current study, displaying attendance was positively and moderately correlated with assessment performance ($r = 0.59$, $p < 0.001$) in a Medicine degree program (Deane and Murphy, 2013). This investigation was only conducted over an eight-week module however, which may explain why the correlation was stronger than the present study consisting of 12 weeks. In arguably the most alike cohort available in the literature, weaker relationships were observed between assessment performance and attendance ($r = 0.21$, $p < 0.02$) within a group of 120 second year physiology degree students (Horton et al., 2012). To corroborate these findings, other studies of a Science and/or Medicine specialism have also displayed similar weak correlations ($< r = 0.39$) between attendance and assessment performance (Gatherer and Manning, 1998; Riggs and Blanco, 1994). In combination, this suggests that attendance has a weaker influence on assessment performance in the Sciences compared to other disciplines. These observations are only reflective of one year of the three-year degree cycle therefore further research may consider the impact of attendance on such a time frame to gain a better understanding of the potential impact of attendance on assessment performance.

Degree and assessment specific attendance – assessment performance relationships

There is a paucity of research evaluating the relationship between attendance on different types of assessment, and the present study's degree and assessment specific findings display contrasting themes compared to the analysis on an overall level. This highlights the need for future research to investigate the effects of attendance on individual assessments and degree programs, therefore avoiding a holistic approach and the reducing the risk of missing potentially important findings. Of note, the strongest correlation was observed for exam performance in SES. The teaching pedagogy in first year undergraduate programs in SES is aligned to a tendency of surface learning due to one of the assessments entailing the completion of an exam. This is considered a valid approach to ease the transition from surface learning during secondary school and further education to deep learning during second and third year of undergraduate study (Donnison and Perry-Edwards, 2012). It is likely therefore the greater amount of sessions a student attended, combined with the pedagogical approach of surface learning, the greater this impacted on exam performance. A similar positive moderate correlation was observed for laboratory report assessments in SES. For this module a workshop for the laboratory report was part of the lecture each week. This likely explains both the high attendance (~90%) and the correlation with attendance and assessment performance, displaying that students considered these sessions valuable. Based on the positive moderate relationships on attendance and performance in the Sport and Exercise module the present study data supports the use of attendance monitoring, if the teaching pedagogy is aligned to the assessment task.

Akin to the findings of SES, similar moderate relationships between attendance and assessment performance were reported in SDMC entailing presentations and essays. The mean attendance was lower by 37% compared to SES however, whilst mean grade in assessment was similar (~2% difference). Nevertheless, considering degree programs of this nature are not dependent on practical or clinical skills (like ST and SES, respectively) attendance may not have been considered as important by the student. Rather, a large component of study is independent and requires no formal attendance to sessions (i.e. independently directed reading). The institution used in this study sets a requirement of around 152 hours independent study combined with around 48 hours face to face teaching (this may vary depending on module). Based on this premise, this may explain why grade average was maintained despite poor attendance in SDMC. Nonetheless, encouraging high attendance is still warranted, as a positive moderate

correlation was observed for both presentation and essay performance within the higher attenders.

The weakest attendance-assessment performance relationship observed was for ST and practical assessments. This is surprising as high attendance to these sessions, in theory, should allow them to gain the practical skills necessary to achieve a better grade in the practical assessment. The lack of a strong correlation may be due to the generally high attendance in this module as all students attended at least 75% of the sessions. A contributory reason for such high attendance may be due to the practical nature of the assessment, therefore students found it important to attend these sessions in order to gain the necessary skills for the assessment. This is in agreement with previous research suggesting students are likely to attended more frequently if they perceive the sessions are central to assessment preparation and passing the course (Murphy, 1998; Browne and Race, 2002; Exley and Dennick, 2004). The high attendance might also explain, in part, why no correlation was observed in this data as there was a lack of variation in attendance rates (range 75 – 100%) compared to the other degree programs (SES = 60 – 100%, ST = 10 – 100%). However, this module did also report significantly greater assessment grades compared to the other degree programs with lower attendance; therefore, suggesting attendance was important to the achievement of higher grades in ST, despite a weak correlation. A benchmark of over 75% attendance therefore is still worthwhile in this case. The added value of attending over this threshold is difficult to determine however, although based on the weak positive correlation it may still have a small impact on practical assessment performance.

Institutional attendance threshold and assessment performance

A unique finding of this study was that students who attended more than 75% of sessions produced significantly greater performance compared to the students who attended less than this threshold. This was evident for all modules in the present study and the difference between median scores could distinguish between degree classifications (3 to 2:2 class honours). The present study is not the first to find this theme, however, as Durden and Ellis (1995) suggested consistent and high attendance improves assessment performance, despite allowing for up to 20% of sessions to be missed. In the hypothetical case that the present study findings were to be consistent throughout the three-year degree cycle, attendance monitoring may be critical as

degree classifications in second and third year of undergraduate study ultimately determine the overall classification. This may be of particular interest to academic institutions to provide the best possible opportunities for assessment performance. These findings also support the use of institutional attendance threshold policies in many UK HE institutions in order to heighten the chances of progression onto the next stage of an academic degree, particularly in the SES. However, raising attendance requirements over this threshold should be considered with caution based upon the weak correlation displayed in ST where all students attended over 75% of sessions; suggesting attendance over this threshold adds only a small effect to assessment performance. Attendance over this threshold should not be discouraged however, as small improvements in assessment would still be considered worthwhile; and the student learning experience is determined by more than just assessment performance.

Whilst potential support for attendance thresholds were evidenced in this study, a caveat is that this do not offer the cause as to how or why improved attendance increased assessment performance; rather, correlations are offered. It could be argued, for example, due to the causal variable of existing academic ability that the more academically able students have better attendance and therefore performed better in the assessment. Equally, the current study did not compare the assessment performance and attendance relationship in an environment where an attendance threshold was not employed by the institution. Based on this factor, it is unknown if the same findings would have been found if no attendance threshold was set by the institution. These findings therefore suggest that whilst attendance could be an important factor for assessment performance, it is unclear if institutions should employ attendance threshold expectations with their learners.

Limitations

A consideration of this study is that only first year student data was analysed and therefore should not lead to interpretation to second and third year students. Equally, attendance to sessions does not always result in improvement in qualities such as students ability, motivation, personality and opportunity to learn, which are also considered key to assessment performance (Deane and Murphy, 2013). Additionally, the present study included different types of sports related degree program, and therefore it cannot be discounted other variables such as age (young vs. mature), income (low and high earning backgrounds) and gender (male and female) could have plausibly affected assessment performance. Indeed, in physiology undergraduates

a greater impact of attendance on assessment performance was observed for females compared to males (Cortright et al., 2011). In contrast, no clear relationship between age (mature vs. young) and assessment performance has been observed in previous research (Hoskins et al., 1997; Richardson et al., 1994). Future research could attempt to either evaluate the same sports degree program over a number of academic years with similar cohorts of the same institution, or even compare between different institutions. The results of the present study were not separated for gender, as the SES degree programs considered in this study were male dominated, and would have resulted in considerable unbalancing of the sample group. Nevertheless, further research could consider the impacts of these factors on attendance and assessment in sport related degree programs.

Summary

This is the first study to display attendance has an important role for assessment performance in first year undergraduate students across SES degree programs and different assessment types. Overall, the present study observations were akin to previous research in science orientated degree programs (Horton et al., 2012), suggesting attendance has a weak effect on assessment performance. Upon distinguishing between degree program and assessment type however, high attendance is of greater importance for exam assessments displaying a moderate correlation with attendance. Conversely, it seems of less importance for practical assessment performance as weaker relationships were observed compared to the other assessment types in this study; although this may have been due to the generally high attendance within this module. Based on the present study findings, future research should distinguish between different assessment types and avoid holistic approaches to investigating the attendance-assessment relationship. Moreover, the use of attendance thresholds within institutional policy are also supported, as over 75% attendance produced significantly greater assessment performance, although direct comparisons with programs without an attendance threshold requires future research to confirm this notion. Regardless of this outcome, attendance is worth monitoring within an institution as it can aid identification of students who are struggling to cope with learning and provide necessary support (Deane and Murphy, 2013). If the subsequent intervention is appropriate, this could also enhance assessment performance, and potentially improve students motivation and opportunity to learn. Lastly, further research is warranted to see if these findings translate beyond the first year of undergraduate study, whilst other factors such as age, gender and income could also be considered.

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Table and Figure Legends

Table 1: Asterisk (*) denotes significantly higher overall performance for Sports Therapy in comparison to Sport and Exercise Sciences and Sport Development and Management and Coaching.

Figure 1: Illustrates the relationship between overall attendance and grade (A) and degree specific performance for Sports Therapy (B), Sport and Exercise Science (C) and Sport Development and Management and Coaching (D).

Figure 2: Illustrates the differences in performance across all degree types in students with low attendance (<75%) and high attendance (≥75%). The high attendance group achieved significantly higher performance (denoted by asterisk symbol [*]) in assessments compared to the low attendance group. Data is presented as median and IQR.