

CodeFit. Investigating the impact of providing free access to campus sports facilities on the mental health and academic outcomes of postgraduate Software Engineering students.

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Abstract— This paper investigates the impact of providing free access to campus sports facilities on the mental health, physical fitness, lifestyle activities and academic outcomes of postgraduate students pursuing a Computer Masters degree at a UK University. Utilising controlled barrier access tracking to campus sport facilities and periodic surveys, data was collected to examine changes in mental health indicators, physical activity levels, and social interactions throughout the academic year. Results reveal a complex interplay between access to sports facilities, mental well-being, and academic performance. While there is an increase in mental health issues during the course, the utilisation of sports facilities correlates with reduced Exceptional Circumstance requests (application for an extension to a coursework deadline or exam deferral) related to stress and anxiety. Additionally, increased attendance and engagement in the course were recorded, as was marginally better academic outcomes. However, students that stated they had frequent mental health concerns statistically performed worse in assessments. Furthermore, while there was a concerning increase in mental health issues among students during the course, there was a decrease in other reported external stressors such as body image, physical health, and loneliness. It is significant that the frequency of students feeling regularly concerned about their mental health in this study was 41%, which compares favorably with the comparative university average of 79%. The findings underscore the importance of providing students with access to physical activity resources and support systems to enhance overall well-being and academic success. Further research is needed to optimise student support mechanisms and promote holistic student development within the university context.

Keywords—programming, mental health, exercise, engineering, university students

I. INTRODUCTION

This innovative practice paper builds on previous research that has established a strong link between physical fitness and engagement in health-related activities, which positively impacts student satisfaction, well-being, and academic achievement among university students ([1][2]). This research aims to extend previous studies by examining the mental health, physical fitness, and lifestyle activities of 108 Postgraduate students pursuing a Computer Masters degree at a UK University. Notably, this study is unique as it provided

students with free access to and actively promoted engagement with university sports facilities throughout their academic year.

Despite the presence of sports facilities on many university campuses, there has been a noted decline in student interest and motivation for physical activity[3]. Understanding motivation is a pivotal concern within student physical activity research. Findings reveal that students were more inclined to cite intrinsic motivators like enjoyment and challenge for their involvement in sports, whereas motivations for exercise tended to be more extrinsic, revolving around factors such as appearance, weight management, and stress relief [4]. Other studies have highlighted that social interaction was the primary motive for student participation in physical activities [5]. One of the most common negative external factors that influenced the exercise of physical activity in the students' population is the lack of free time due to the schedule at the course [6]. Many studies conclude that less than 50% of students do not engage in regular physical activity, with around 16% regarded as totally physically inactive [7].

Moreover, literature highlights a global trend of declining mental health, including among university students [8], with most studies reporting a significant number of students expressing severe and extremely severe levels of depression, anxiety, and stress, marking a significant increase compared to prior years. Academic performance, pressure to excel, body image, and relationships emerged as key stressors. Noteworthy predictors of mental well-being comprised pressure to succeed, self-esteem, body image, and interpersonal connections with friends and family.

Consistent physical activity enhances both physiological and psychological well-being [9]. Despite these established benefits, activity levels typically decrease from high school to university. This decline in physical activity, coupled with heightened academic demands and significant life changes among university students, contributes to elevated stress and anxiety levels, poor mental health, with increased dropout rates, increased exceptional circumstances and poor student experience and academic performances.

II. METHODOLOGY

The MSc in Software Development (SD) is a *Conversion* course for students that hold a previous non-computing degree. It would be widely regarded as an intensive course with many students having left full time jobs to take the course for one academic year in an attempt to change careers into the

Software industry. Consequently, the students exhibit high levels of motivation, having made significant financial and lifestyle adjustments to transition to full-time education. They typically experience intrinsic pressure to excel in the course, resulting in a higher than usual number of Exceptional Circumstances (ECs) related to stress and mental health issues

In this study individual student activities were monitored via barrier access tracking at the campus sports facilities. Surveys were conducted to gather demographic information, assess mental health indicators (depression, anxiety, stress), identify potential stressors, and examine other lifestyle activities such as part-time work and social media usage. Surveys were completed during induction week and at week 24 after the taught part of the course. The surveys encompassed demographic, mental health, and well-being inquiries. Participation in the surveys was voluntary and responses were anonymized, although a participant ID was employed to correlate responses with individual student course results, facilitating later analysis of associations with module scores. The collected data, including Learner Analytics via VLE activity and attendances and survey responses, were integrated with course-related activities and outcomes such as student satisfaction and course results. Various statistical based analyses were conducted to investigate the impact of increased access to physical activity resources on course performance, dropout rates, exceptional circumstances, mental health, and student satisfaction.

III. RESULTS

A. Mental Health

As depicted in Figure 1, prior to the course, 30% of the cohort indicated experiencing frequent mental health issues. Alarming, this proportion escalated to 56% during the course.

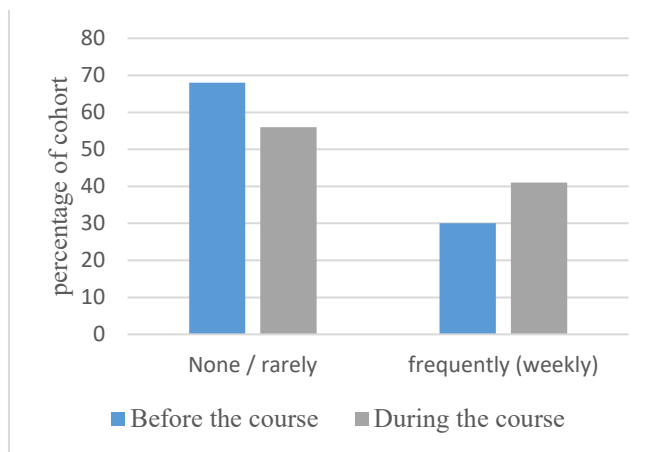


Figure 1 Student self-report mental health concerns

Further reporting on the main mental health stressors are detailed in Figure 2. Similar to other studies, course pressures were the main stressor throughout the students' time at university. However, unlike many previous studies other reported stressors actually declined during the same period, this included relationships and body image / physical health. The decline in work pressures is likely best attributed to the

numbers of students that resigned from their part time jobs throughout the course, dropping from 50% to 42% combined with a very significant decline in part time hours worked per week throughout the year.

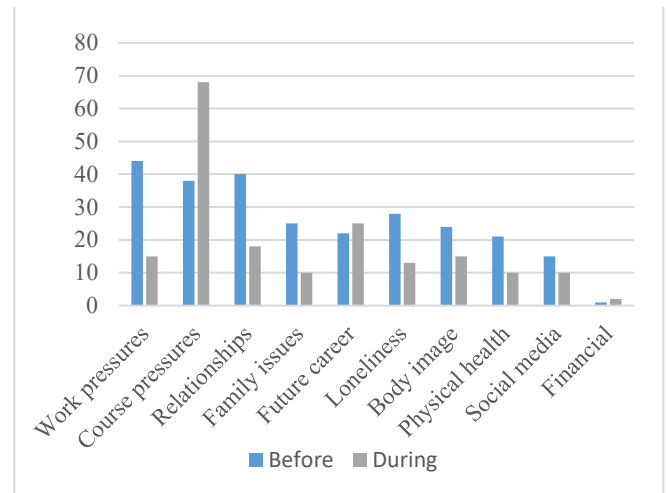


Figure 2 Main stressors for Mental Health issues at the beginning and at the end of the course.

B. Use of Campus Sport membership

As anticipated, there was a notable variance in the utilization of the free access to the Campus Sports facilities, despite all students receiving an induction and tour of the main facilities, 53% of students never utilised the facilities. However, in contrast to the average University student usage of the On Campus Sports facilities of 8%, the cohort in this study demonstrated a higher engagement, with 37% utilising the facilities on a reasonably regular basis. As detailed in Figure 3 there was variance in usage per week, ranging from 20% engaging very frequently to 17% with occasional usage. 6% of students had their own external gym access and did not use the on Campus Sport facilities but continued to be physically still active.

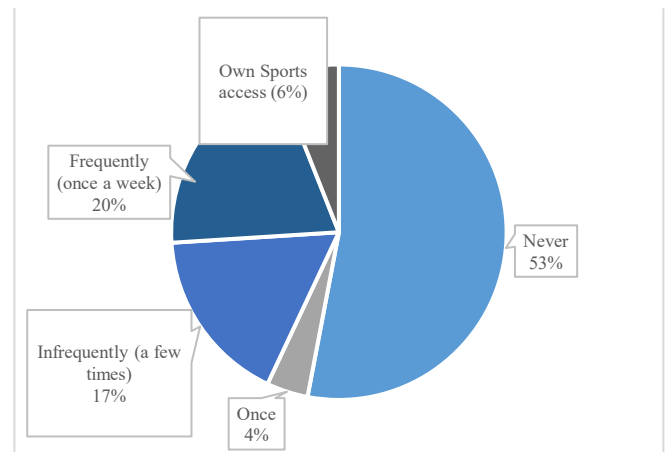


Figure 3 Frequency of use of free Campus Sport Access

C. Physical activity

As depicted in Figure 4, the majority of the cohort reported an engagement in some form of physical activity of more than once a week. It is important to note that this figure encompasses their on campus sports facilities access and other external activities such as walking. There is a slight decrease

in physical activity levels during the course. However, given the intensive nature of the program, it is plausible that the availability of free access to campus sports facilities likely contributed to sustaining this relatively high engagement throughout the course. Many students were recorded utilising the on campus sport facilities during lunch breaks or after scheduled course activities. This contrasts positively with the majority of previous research reporting a significant decline in physical activity of students, mainly due to course pressures.

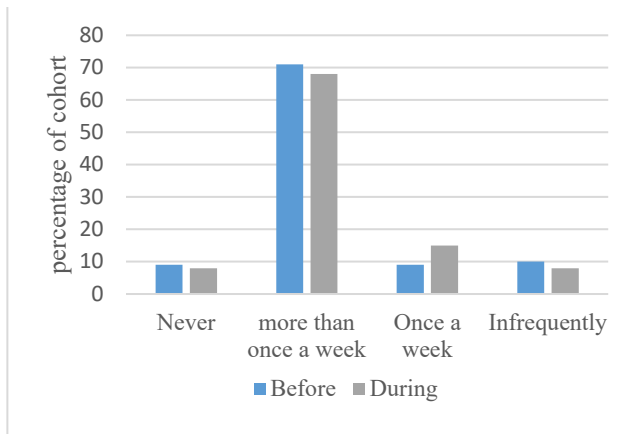


Figure 4 Frequency of physical activity

D. Frequency of social interactions (non-sporting)

It is notable that there was a decline in reported social activities throughout the course (Figure 5). Likely caused by course pressures, there was a drop in frequent social interactions from 72% to 63%. While the course has frequent social activity opportunities it is unclear whether the students regarded these within their reported engagements. A small number of students did not engage either before or during the course in any activities.

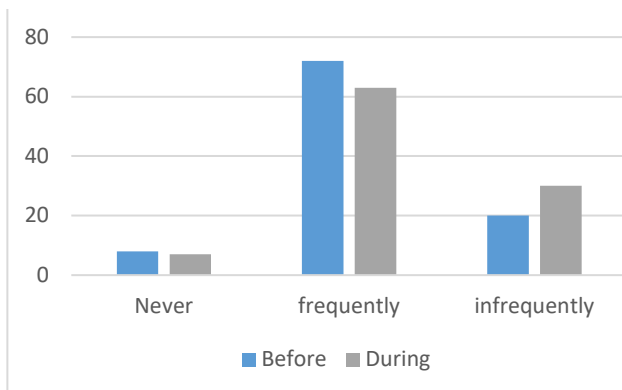


Figure 5 Social activity engagements

E. Impact on Mental Health

Relative to other courses in the faculty and university historically the MSc SD course receives a large number of Exceptional Circumstances (EC) requests, whereby a student makes a request for an extension to a coursework deadline. In this study there was a clear drop in the number of EC requests processed compared to historic averages. Data obtained from processed EC requests for the cohort, showed a reduction in the total number of EC requests from historic average of 119 to approximately 51 in this study, resulting in a decline of 43% in requests made. For both academic semesters, the cohort

undertake the three taught modules CSC7052 Databases, CSC7061 Programming and CSC7064 Computing Foundations in Semester 1, followed by the three taught modules CSC7053 Software Engineering, CSC7061 Programming and CSC7062 Web Development in Semester 2 (it should be noted, the CSC7061 Programming module runs in long-thin mode across both semesters). Correspondingly, in terms of each module, the percentage of reduction in EC requests made is as follows: CSC7052 Databases (48%), CSC7061 Programming (64%), CSC7064 Computing Foundations (50%), CSC7053 Software Engineering (17%) and CSC7062 Web Development (38%). As each module may have multiple pieces of summative assessment, the totals provided do not distinguish between the number of assessment points for a module, as students may potentially make multiple requests for an individual module. Figure 6 illustrates this reduction in requests for each module from historic averages.

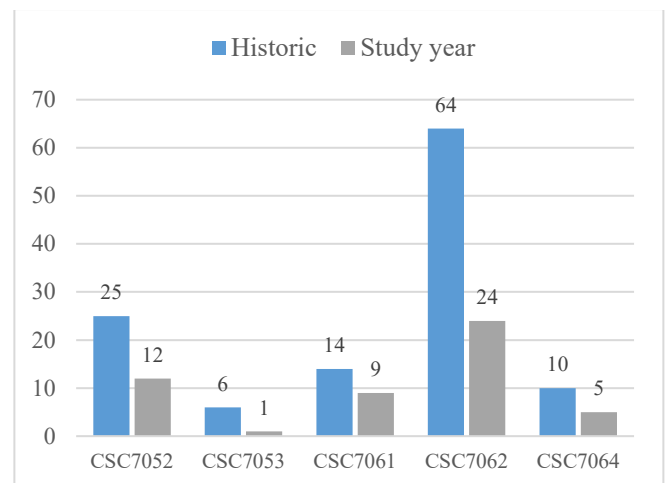


Figure 6 Reduction in EC requests per module

As can be observed in Figure 6, while the number of requests for each module has been reduced, the total number of requests for each module remains proportional to each module with various factors, including nature and timing of assessments, predicating the typical number of requests made for a module. As such, a module such as CSC7062 traditionally receives an increased number of requests due to aspects such as learner fatigue given its scheduling towards the end of the taught content for the course. In addition, while all other modules offer multiple assessment points, the CSC7062 module has a single assessment point, which may also potentially contribute to the traditional increased number of requests made for that module. EC requests may be submitted as either self-verification (i.e. a student can request a short extension without evidence) or with evidence (i.e., a student can request a longer extension with supporting evidence), however, anecdotal evidence would appear to indicate a larger number of requests were made under self-verification in the academic year for this cohort, such as minor illnesses and mishaps, rather than requests made with evidence, such as longer term wellbeing issues, which are commonly pre-empted by a meeting with the students' Advisor of Studies (AoS) prior to submission of a corresponding EC request or more serious course of action. Historically, there were on average 12 AoS meetings to discuss academic options, and a marginal increase to 13 AoS meetings in the cohort in this study. However, the number of

temporary withdrawals has decreased, from nine on average to five for this cohort, while there has been a similar number of permanent withdrawals from the course,.

F. Engagement and student satisfaction

In this study lecture attendances were up from the historic 75% to on-average 82%. Ongoing engagement measured via VLE activity was also up by 12% from previous years averages. In terms of academic outcomes the Programming module (CSC 7061) had a similar mean score compared to previous year but an increase pass rate of 94% compared to the historical 89%. The student satisfaction rating for the course is generally considered to be high at 90%+ and that was the case for this cohort. At module level there was a marginal increase in module and teaching experience scores.

G. Academic outcomes related to stated Mental Health

The mean score for the modules for individuals reporting no significant mental health (MH) issues (answering rarely or never) was higher compared to those reporting significant mental health issues (daily or weekly) in the CSC7061 module. Specifically, individuals with no significant MH issues scored a mean of 69.4% (SD = 10.41), while those reporting significant MH issues scored a mean of 63.7% (SD = 12.63). A two-tailed t-test was conducted to compare these mean scores. The test revealed a p-value of 0.0612, indicating an approaching significance level ($t(50) = 1.9605$, $p = 0.0612$). Considering the small sample size it is likely that a repeated pattern in a large cohort would be very highly significant.

In terms of scores there was little to separate the groups that regularly used the free Sports access frequently (67.5%) and those that generally did not (66.8%). However the question would be did the users of the gym benefit from being more physically active compared to if they did not?

H. Feedback from students

Students provided valuable insights into the impact of access to campus sports facilities on their well-being. One student remarked, *"The gym membership has been incredibly beneficial to me this year for giving me a healthy break from study and I think it would benefit future students also."* Another emphasized, *"The free access to the sports was a game-changer and definitely made fitting wellbeing into my schedule a lot more manageable."* Reflecting on the initiative, a student stated, *"I think the gym membership initiative has been an excellent idea,"* highlighting how it enabled them to incorporate exercise into their daily routine while on campus. Additionally, a student suggested, *"If there was something for non-sporty people too - something to do with art or having a creative outlet always helped my mental health in the past."* Furthermore, another student acknowledged, *"I find that I use exercise as a coping mechanism when it comes to mental health,"* underscoring the multifaceted role of physical activity in managing mental well-being. These testimonials underscore the importance of providing diverse opportunities for promoting student health and well-being within the university environment.

IV. DISCUSSION

The results suggests a complex relationship between various factors impacting student well-being and academic performance within the university setting. When provided

with the free access there was a relatively good uptake of use from the students. Despite it being free the frequency of use was comparable to the use of the facilities by self-funding students. Overall there was a much higher utilisation of campus sport facilities for this cohort compared to the university average sport membership (8%). While there was a small decrease in overall physical activity throughout the course, it was significantly less pronounced than in the general university body, that reported 26% rarely or never engaging with physical activity [10]. The provision of free campus access to sports facilities and the utilisation of these amenities during lunch breaks may partially support this trend, indicating a need for further exploration into optimising physical activity engagement around course timetabling.

Furthermore and largely attributed to course-related activities, there was a concerning increase in mental health issues among students during the course. However there was a decrease in other reported external stressors including body image, physical health, and loneliness. Further study to examine the potential links between the usage of the on campus sports facilities and trend is warranted. However, the frequency of students feeling regularly concerned (at least once a week or more) about their mental health in this study was 41% which compares very favourably with the comparative university average of 79% [10]. This underscores the importance of evaluating the nature of these activities and implementing strategies to mitigate associated stressors.

Interestingly, there is a reduction in social interactions among students. Nevertheless, this decrease does not appear to significantly correlate with loneliness, suggesting that the course structure and potentially free access to campus sport may still allow for adequate social engagement. Of note there was also an increased attendance and engagement in the course, with module averages and pass rates marginally improved.

The substantial reduction in Exception Circumstance (EC) requests in this study related to stress, anxiety, and mental health concerns, (decline of 43%) underscores the potential impact of the inclusion of support systems such as free access to campus sport facilities in mitigating stressors and promoting mental well-being among students. It suggests that students may feel better equipped to manage challenges without the need for formal accommodations, indicating a positive shift in the overall support framework within the university environment. By identifying and addressing underlying stressors, universities can enhance student resilience and foster a conducive learning environment conducive to academic success and well-being.

In summary, the findings highlight the intricate interplay between physical and mental well-being, social interactions, academic engagement, and student satisfaction within the university context. Further research and targeted interventions especially in relation to promotion and access to physical activities via campus sport facilities are warranted to optimise student support systems and promote holistic student development.

A. Limitations of the study

The students involved in the study were post graduate and in the Computing discipline and as such the scope of further study could include undergraduate and other disciplines. The number of students is limited to the size of the cohort and

expanding the same study to greater numbers would be of interest as would re-running the same experiment with a new intake cohort.

V. CONCLUSION

This study points to the importance of providing students with access to physical activity resources and actively promoting their engagement. The findings suggest that such initiatives support overall student well-being and satisfaction and potentially improved academic performance and student experience. Moving forward, universities should prioritize investments in physical fitness facilities and programs to foster a healthier and more successful student population.

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