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Reflections on a Discipline-Based Recreational "Game Day" for Chemical Engineering Students: A Qualitative Case Study on Wellbeing and Learning

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ABSTRACT

In response to student requests for stress-relief opportunities, a discipline-specific "Game Day" was piloted in 2022 by the Chemical Engineering Student Association (CESA) at a major contact South African university. Facilitated by staff representatives, the event provided a relaxed environment for undergraduate students to engage in recreational activities, foster peer connections, and unwind from academic pressures. This article presents a reflective case study of the Game Day, applying the structured Gibbs reflective model by the current and former CESA Representatives. Without formal outcome measures, insights of the Game Day intervention were derived from firsthand observations and informal student feedback. The reflections suggest that such low-cost, student-led initiatives may create an enhanced sense of inclusion, motivation, and community, contributing to the informal development of teamwork and social support networks. A seven-step action research framework is proposed to guide the adaptation and implementation of similar recreational interventions in other academic departments.

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Introduction

Background, Context and Aims

Engineering education frequently places heavy demands on students, leaving little time for rest, reflection, or community-building. Although university-wide recreational activities exist, discipline-specific interventions that combine social engagement with academic support are uncommon. This article examines a reflective case study of a "Game Day" event designed specifically for chemical engineering students at a major contact South African university. The intervention aimed to foster connection, alleviate stress, and informally enhance learning through team-based games and peer interaction. By framing the study as a reflective exercise, rather than an evaluative experiment, the value of qualitative insight into student wellbeing and engagement is acknowledged.

The COVID-19 pandemic lockdown compelled students to self-isolate for several months. During this time, higher education institutions rapidly migrated their pedagogical approaches to remote and online practices. Due to the rapid transitions, students faced incredible pressure to keep up with the changes they experienced during the transitions, and additional pressures to complete their studies without face-to-face contact with their lecturers, tutors, and peers. The impacts of student isolation have been reported in the literature. Such social isolation created a sense of loneliness, thus adversely affecting the students' mental health (Loades, Chatburn, Higson-Sweeney, Reynolds, Shafran, Brigden et al., 2020). A more detailed study found that social isolation had a negative psychological impact on students by contributing to post-traumatic stress disorder, anxiety, and depression (Liu, Zhang, Wong, Hyun & Hahm, 2020). The theme of increased stress, anxiety, and depression levels among students resulting from social isolation during the lockdown continued in the research of Wang, Zhang, Zhao, Zhang & Jiang (2020) and Li, Wang, Wu, Han & Huang (2021).

To help alleviate student isolation and socially re-integrate students on campus after the lockdown, the Chemical Engineering Student Association (CESA) at a major South African university piloted its first "Game Day" in 2022. It is argued that Game Day creates a sense of belonging among students, enabling them to feel a sense of being part of a community, similar to that of a student religious society (Seedat and Roopchund). These positive feelings should help to keep students motivated. This study first aims to provide structured reflections on Game Day as an intervention to promote student centeredness using the Gibbs reflective model (Gibbs, 1988). Secondly, the study aims to

formulate an action plan to improve subsequent Game Day iterations to maximise their potential impacts.

Hybrid Teaching and Learning and its Effects on Student Experience

Shortly before the lockdown was completely eased (semester 1 of 2022), hybrid lectures were implemented to ensure adequate social distancing in the lecture halls. During this time, the class was divided into two groups (A and B). These groups alternated between physical attendance and online attendance. When group A attended the physical class, Group B attended the online class simultaneously. The classes were recorded. Although some interactions were present, students still reported feeling isolated, as they may not have been able to attend classes with their friends and familiar peers. Furthermore, many assessments were still conducted online during the hybrid learning period. Despite being able to see and interact with their peers, factors such as social distancing, constant sanitising, and the use of masks prevented students from achieving complete engagement with one another, or with their lecturers and tutors.

Complete contact classes were officially re-introduced in semester two of 2022. For the first-year students, this implementation provided their first opportunity to experience a contact higher education environment. For the second-year students, many had become acquainted with online teaching and learning during the lockdown, and experienced challenges in returning to contact teaching and learning. Hence, the students requested a Game Day to help relieve their stress, enable them to meet other students across different years of study, and form lasting friendships.

Why Reflect on the Influence of Recreational Activities on Student Living and Learning?

Recreational activities, such as Game Day, are important to students for several reasons. Firstly, they contribute to the overall wellbeing and mental health of students, by creating a 'release' in which students are free to socialise and engage in meaningful conversations with one another without any pressures or constraints of teaching and learning activities. Such a care-free environment aids in alleviating stress, depression, and anxiety - all too prevalent among engineering students. The therapeutic advantages of recreational activities, and their capacity to lift students' moods and reduce psychological distress was highlighted in the research of Penedo and Dahn (2005). Additionally, participation in recreational activities helps students to develop social competencies and life skills. Graduate attributes such as problem-solving, leadership, teamwork, and

communication are informally developed through participation in recreational games offered on Game Day. These attributes are vital for academic and professional success (Bowman, 2010). In addition to social interaction, recreational activities also promote community building, enabling students to form significant relationships with their peers and develop a sense of community on campus (Kuo et al., 2019). The significance of reflecting on recreational activities allows university facilitators to gain insights into how to improve and incorporate these activities into the student experience, to enhance the holistic development and academic success of students.

Why do Engineering Students Need a Game Day? Literature Motivations

The study of Lichtenstein, McCormick, Sheppard and Puma (2010) reported that while engineering programmes provided substantially greater advances in practical competence and higher-order thinking in relation to other university majors, engineering students were required to spend more time preparing for class, implying that they have less time to participate in educationally elevating experiences. Hence, it is common that undergraduate engineering students do not have as much time to socialise and engage in recreational activities as do students of other majors. Notably, engineering students are also deprived of interactions with peers in higher levels of study.

Cruz and Kellam's (2018) study found that students entering engineering do not fully comprehend what is entailed in an engineering programme. Therefore, first-year students can substantially gain from interactions with peers in the field. Cruz and Kellam (2018) further indicate that such interactions can help students to be mentally prepared to persist amidst cognitive challenges when they begin coursework. Such a strategy can reduce dropout rates of engineering students.

The study of Meyer and Marx (2014) determined the underlying themes resulting in the relatively high dropout rates in engineering disciplines. The individual factors culminating in the high dropout rates included challenges fitting into engineering, meagre performance, and feeling unprepared to meet the demands of the engineering programme, while institutional factors included a dissatisfaction with engineering tuition support. Notably, both individual and institutional factors resulting in high dropout rates can be resolved through an intervention such as Game Day. As such, the CESA representatives deem Game Day as a greatly required intervention for students to find their sense of community and support amid the chaos of their cognitively demanding qualification.

Structured Reflections Using the Gibbs Model

The Gibbs reflective model (Gibbs, 1988) is integrated into the body of this reflective study. Each section incorporates elements of the model, including the description of the intervention, personal reflections and feelings, evaluation and analysis of the impact, and the conclusion with an action plan. This model allows for a comprehensive exploration of the Game Day intervention while providing a reflective and introspective perspective on the case study. A schematic of the cyclic model is shown in Figure 1 (Husebø, O'Regan & Nestel, 2015). Author 1 served as the CESA departmental representative, while Author 2 was his predecessor. The authors share their direct reflections in certain parts of the study in these respective capacities.

This reflective case study highlights the potential value of modest, low-cost interventions that foster community and reduce stress within disciplinary cohorts. While not based on formal metrics, the observed and shared experiences offer promising signals for future structured research on wellbeing in engineering education. Institutions might consider embedding such initiatives more regularly, supported by rigorous assessment methods to better evaluate their long-term impacts.

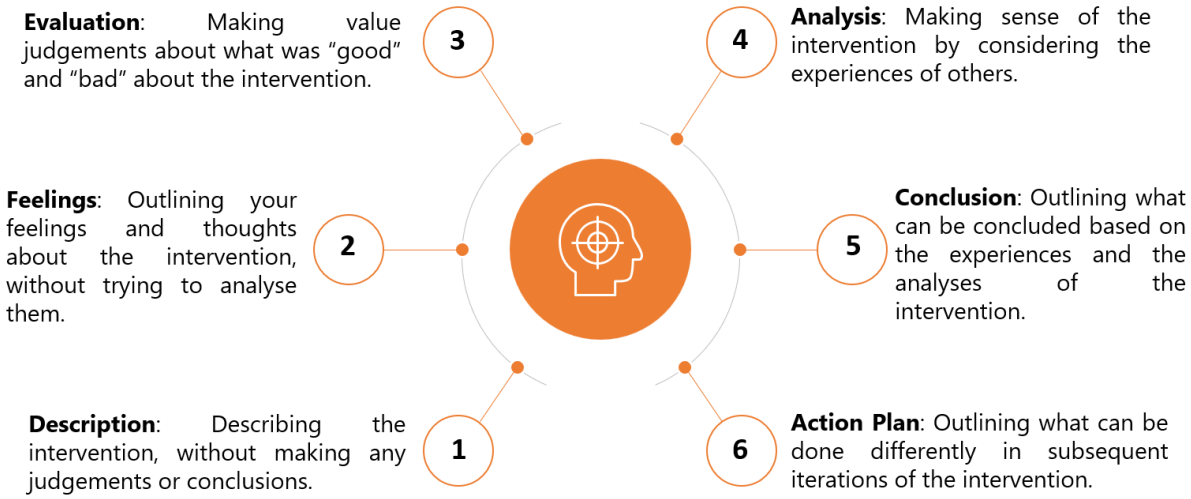

Figure 1: Gibbs reflective model schematic (Gibbs, 1988) as applied in this study.

Description of the Game Day Event

Overview of Game Day

Various recreational activities for higher education students have been reported in the literature. These activities include sports and physical activities (Kozechian, Heidary, Saiah & Heidary, 2012; Sanderson, DeRousie & Guistwite, 2018), social and cultural events (Zuniga, Williams & Berger, 2005; Kuh, Schuh, Whitt & Associates, 2010), arts and creative activities (Fink, 2014; Nielsen, Hinrichsen, Madsen, Nelausen, Meilstrup, Koyanagi et al., 2021), and outdoor and adventure activities (Schultz, Shriver, Tabanico & Khazian, 2004; Vlamis, Bell & Gass, 2011). Considering that students typically do not enjoy strenuous or 'cognitively intense' activities for recreation, the requested Game Day is a student preference that was recommended by the students. Game Day typically occurs twice a year, towards the end of each semester, either just before the start of examinations or once they have finished. This event entails a gathering of students who collaborate beforehand to identify the games and activities that they would like to participate in during the session. The students meet at a large venue (booked for them by the staff facilitators), set up a beverage and snacks station (sponsored by the department), and then begin their games. After they have completed the games, the students clean up the venue, reset the chairs, and leave. The two CESA staff representatives are responsible for booking the Game Day venue, proposing the budget, procuring the snacks and beverages, and ensuring that students participate responsibly and within the university's code of conduct.

Students exhibit visible excitement in the days leading up to the Game Day. They also appear to be motivated to complete their academic assessments and tasks leading to the Game Day, as they know that they will be rewarded with a fun and relaxing break afterwards.

Author 1's Reflections:

Considering the cognitive demands placed on engineering students- especially those in first year, I was happy to implement Game Day as an intervention to help students deal with their stresses, unwind, and have a chance to socialise with students across different years of study. I believe that Game Day in its entirety enables students to share enriching interactions with each other - leading to valuable information exchange, moral support, and the formation of communities of practice.

Author 2's Reflections:

As the previous CESA departmental representative, the only recreational event then was the Chemical Engineering Ball, which students eagerly awaited as the social highlight of the year. I believe that the implementation of an initiative such as the Game Day during my tenure as the CESA departmental representative in 2019 would have been overwhelmingly welcomed by students as a safe place to socialise and meet students from other years of study.

Feelings and Personal Reflections

Personal Observations and Emotions Related to Game Day

Author 1's Reflections:

I have encountered increased engagement from students when participating in the Game Day activities. I have observed that every student is fully involved and absorbed in the activities of the day. No student is isolated from the group, and every student is enjoying themselves. Typically, during class activities, students do not necessarily engage with one another. However, during Game Day, I observed improved social interactions between students across multiple levels (years) of study. Such interactions result in a sense of connection and community, similar to that experienced by staff members during team building exercises. During the collaborative exercises among the students to identify games they would like to play, students develop confidence and communication skills. I also observed that students display positive energy, excitement, and enthusiasm prior to the Game Day.

Based on the observed behaviour of the students, I experience a sense of satisfaction and fulfilment, as I believe that I am actively contributing towards a student-centered environment. I feel motivated to expand my contributions to students' personal growth and wellbeing outside the classroom. I feel that the joy and happiness experienced by the students is transferred to me. These feelings create a sense of belonging, which I believe aids in student retention and satisfaction. The supportive atmosphere created by Game Day promotes the inclusion of all students - regardless of gender, race, age, race, and sexual orientation. I believe that the ability of students to include others - regardless of their perceived differences - helps to create future leaders that value diversity and inclusiveness. Such development makes me proud of my students. Observing my students exhibiting confidence and autonomy in planning the Game Day is empowering to me, as I gain a sense of relation to my students - those I have taught, those I am currently teaching, and those I am yet to teach. I am

further encouraged by the initiative shown by students. For example, one of my students offered to raise funds among the student population to purchase snacks and beverages for the pilot Game Day in 2022, which was later supported by the department.

Author 2's Reflections:

Prior to the pilot implementation of Game Day in 2022, I believe that the previous student cohorts would have greatly benefited from this intervention to balance their social and academic lives. Many students would have been actively involved in assisting in organising and co-ordinating the event as the previous CESA body was very dynamic, especially the postgraduate students. In hindsight, I believe that such an initiative was not even at the point of conceptualisation as the only social event any student body organised was the Annual Ball. Based on the changes that have occurred in terms of students being more involved in their holistic development through the Game Day initiative, I believe that the role of student bodies has evolved to become more inclusive and innovative in becoming more student centered.

Reflection on the Importance of Recreational Activities for Student Wellbeing in Relation to Game Day

Author 1's Reflections:

Considering that the significance of recreational activities is well documented in the literature, this section incorporates my reflections alongside literature practices. Kim and McKenzie (2014) found that recreational activities reduced stress levels and enhanced the overall wellbeing of students. Similar findings were observed in students before and on Game Day. Due to the overwhelming success of the pilot Game Day in 2022, two Game Days were requested by students in 2023, and 2024.

Student responses varied in focus but consistently reflected appreciation for the opportunity to socialise in a discipline-specific setting. Some students highlighted that the event offered a rare chance to interact with peers outside of academic activities. Other students mentioned how working in informal teams allowed them to engage with classmates they usually do not speak to during lectures. These insights were recorded anecdotally and discussed during post-event conversations between staff and students.

Examining the Impact of Game Day on Student Centeredness

A content analysis (Hsieh & Shannon, 2005) was used to examine the impact of Game Day in creating a student-centered environment by recalling conversations with students about their Game Day experiences and using permitted photographs and video recordings of the event. A few students personally contacted Author 1 to express their gratitude for honouring their request to host Game Day. When asked about their individual experiences, students were overwhelmed with positive emotions and sentiments related to the occasion. One of the students went to the extent of personally funding the beverages and snacks, as the departmental budget was exhausted before the pilot Game Day. Thereafter, a few staff members contributed personal funds towards the reimbursement of the student. When questioned about why the student wanted to spend personal funds to support the event, she replied that Game Day meant a lot to her and her peers. Hence, she wanted to increase the joy and excitement of the event by providing beverages and snacks.

The photographs showed students co-operating with one another during the set-up of the venue, and displaying visible excitement, laughter, and joy when participating in the creative games and competitions. These observations were corroborated with screams of laughter in a few video recordings shared by the students. Based on these observations, Game Day was successful in creating a student-centered atmosphere to relieve the stress of students and improve their overall wellbeing. Future work will include a qualitative study (requiring ethical clearance) to conduct focus group interviews with students to explore individual perspectives, emotions, and perceptions related to Game Day (Creswell, 2013).

Evaluation and Analysis

Assessing the Effects of Recreational Activities on Student Living and Learning in Relation to Game Day

Observations and reflections are used to assess the effects of Game Day on student centeredness using four stages of reflective evaluation in Student Engagement, developed by the authors, as adapted from Healey and Jenkins (2009) to evaluate and analyse Game Day as shown in Table 1. According to Healey and Jenkins (2009), students are seen as partners in inquiry-based learning. Based on this foundation, the proposed reflective evaluation stages provide a methodological

framework to evaluate whether the Game Day intervention fostered engagement, while remaining open to iterative improvement.

Table 1: Reflective evaluation of Game Day

Stage	Description	Elaboration
1	Describe	Within this stage were the tangible aspects of Game Day, which included convenience conversations with random students who contacted Author 1 to share their experiences about Game Day, including photographs, and video recordings of the event. Students played a few conventional board games and created innovative competitions, such as the "toilet paper bride", which entailed the pairing of one male and one female student. The male student was required to create a wedding dress for the female student using only toilet paper. Once the bridal outfit was complete, each pair was required to showcase their creation. The spectators voted for the best pair, who were then announced as the winners. Students exhibited co-operation, collegiality, friendship, collaboration, and overall team building throughout the event, and during its planning phase.
2	Analyse	Regarding the observed experiences and interactions, students exhibited an overall satisfaction with and appreciation for the pilot Game Day in 2022 and insisted that the culture of Game Day be continued into subsequent years. Concerning the power dynamics and motivations within CESA, the motivations that encourage the organisation to facilitate Game Day include the students' desire to engage, connect, and interact with one another. Students want to feel a sense of community, belonging, and connection through a fun event that brings them together. Such practices promote a student-centered environment which alleviates social isolation, and the mental effects associated with studying a cognitively demanding major, such as Chemical Engineering.
3	Interpret	When considering the deeper significance of the interactions and experiences, Game Day is considered to have an overall positive impact on the students. The emotional impacts of Game Day include inducing positive emotions in students, which outweigh the stresses and pressures of campus life.
4	Evaluate	Reflections on the value and effectiveness of Game Day are undertaken using a SWOT (Strengths, Weaknesses, Opportunities, and Threats) Analysis. The strengths include the extrinsic (laughter, joy, collaboration, team building) and intrinsic (improved mood, release of endorphins) benefits of the initiative. The weaknesses could include the Game Day not occurring more frequently (only once per semester), and limited funds being available to facilitate the initiative. Opportunities include the potential to seek external funding to improve the offerings of Game Day, or to host more frequent Game Days (twice a semester). Threats include the potential of students misbehaving or not abiding by university policy during Game Day. The opportunities and strengths clearly offset the threats and weaknesses of Game Day, thus eliciting its clear benefits.

Exploring the Relationship Between Recreational Breaks and Academic Performance in Relation to Game Day

The literature findings surrounding the relationships between recreational breaks and academic performance are discussed in relation to Game Day. The study of Trougakos, Hideg, Cheng and Beal (2014) determined the effects of regular employee breaks on productivity. Regular breaks were found to increase energy and focus, boosting productivity. Although the study focused on the workplace, the findings can be extrapolated to the higher education sector, implying that regular recreational activities, such as the preferred Game Day, can enhance student performance. Another study conducted by Wolff, O'Connor, Wilson and Gay (2021) similarly investigated the impact of relaxation activities during breaks on job performance. Aligning with the study of Trougakos et al. (2014) and its implications for Game Day, meaningful leisure activities led to improved job performance.

In the academic context, the study of Weinstein, Husman and Dierking (2000) analysed the impact of recreational breaks on academic achievement and student engagement. Considering that regular breaks yielded higher levels of engagement, leading to improved academic achievement, implementing enjoyable and rejuvenating activities into students' study routines can enhance their learning outcomes. Despite this study not considering the more comprehensive break offered by Game Day activities, the principle that regular breaks lead to improved performance is still valid. Similar to the study of Weinstein et al. (2000), Huesman, Brown, Lee, Kellogg and Radcliffe (2009) found a definite correlation between participating in recreational activities and academic achievement. Overall, the students engaging in leisure activities displayed greater motivation, reduced stress, and improved academic performance. No extrapolation of the findings from the studies of Weinstein et al. (2000) and Huesman et al. (2009) were required, as they directly deal with higher education students.

When considering the findings of Weinstein et al. (2000) and Huesman et al. (2009) in the specific context of Game Day events, it must be noted that Game Day is designed according to the following parameters: scheduled at the end of each semester, just before examinations, after classes and tests have concluded, is voluntary and open to all the Chemical Engineering students across all years of study (undergraduate and postgraduate). Based on the participating students' informal feedback and anecdotal reflections, such design parameters ensure that Game Day occurs when students are most receptive to its offering, ensuring a greater impact on students' productivity and performance.

In its pilot implementation, Game Day attracted approximately 70 undergraduate participants, mainly in the second and third years of study, with a steady rise in this number in subsequent iterations.

Conclusion and Action Plan

Summary of the Findings and Key Insights from the Case Study

Through structured reflections using the Gibbs model, coupled with student responses, Game Day was found to be well received and appreciated by the student participants. Although the focus of the student responses varied, they consistently indicated an appreciation for the opportunity to socialise in a discipline-specific setting. While some students highlighted that Game Day provided them with a rare chance to engage with peers outside of academic commitments, others noted how interacting in informal teams enabled them to engage with peers they usually do not speak to during academic activities. These perceptions were documented anecdotally and discussed during post-event conversations between staff and students.

According to the reflections of the Game Day facilitator and previous CESA chairperson, Game Day positively impacted the students' overall well-being and mental health, thus supporting the argument of the study. Additionally, the study's aims were met.

Implementing recreational activities requires planning and budgeting. The proposed action plan can aid university staff members in implementing similar interventions for students in other academic departments. Additionally, the action plan will be used to optimise subsequent Game Days within CESA.

Implications for Implementing Recreational Activities in Other Academic Departments

This study highlights the positive impact of recreational activities on student living and learning within the Chemical Engineering department at a major South African university. Implementing similar interventions in other academic departments can aid students' overall well-being and academic success. The implications for such implementation are shown in Table 2.

Table 2: Implications of implementing recreational activities for students in higher education

Implication	Elaboration
Promotion of creativity and autonomy	The Game Day reflections highlight how recreational activities stimulate students' creativity, autonomy, and social integration. Giving students a chance to function as playful human beings in a fun setting provides an outlet to escape the stress and pressures of their studies. Implementing similar activities in other departments can encourage students to explore their creative potential, think critically, and develop problem-solving skills (Elisondo, Soroa & Flores, 2022), thus promoting a holistic approach to learning and preparing students for real-world challenges.
Enhancing social connection	The recreational activities comprising Game Day provide opportunities for students to engage with each other, cultivating social bonds and a sense of community (Bittman, Snyder, Bruhn, Liebfreid, Stevens, Westengard et al., 2004). Implementing such activities in other academic departments can help alleviate social isolation and establish an encouraging learning environment in which students feel connected to their peers and academic staff.
Community building and resource sharing	The Game Day event facilitated community building within the Chemical Engineering Department and promoted resource sharing among students across different years of study. Implementing recreational activities in other departments can foster collaboration, knowledge sharing, and the formation of academic communities of practice (Wenger, 1998). These occurrences create an environment where students can support and learn from one another.
Stress reduction and improved mental health	Game Days offer a break from academic pressures and serve as stress-relief opportunities (Smyth, Ockenfels, Porter, Kirschbaum, Hellhammer & Stone, 2019). Implementing these activities in other departments can provide students with opportunities to relax, unwind, and recharge, thus promoting improved wellbeing and mental health.

Proposed Action Research Plan for Implementing Recreational Activities for Higher Education Students

Considering the advantages of implementing recreational activities for students, and drawing from the reflections of Game Day, a seven-step action plan was proposed in line with the action research paradigm (shown in Table 3). The proposed action serves two purposes. Firstly, it can be used by CESA to improve subsequent Game Days. Secondly, it can be used by other academic departments to plan and implement similar recreational activities for their students.

Table 3: Proposed (cyclic) action research plan for implementing recreational activities for higher education students

Step	Explanation	Description
1	Identify the problem	Recognise that there is a need for increased student engagement and wellbeing within the student population, which can be addressed by implementing recreational activities (King, McQuarrie & Brigham, 2021).
2	Plan and implement	Develop an action plan based on the identified needs, in partnership with the student representatives. The action plan will entail establishing a Departmental Student Committee, conducting a needs assessment, planning diverse activities, allocating resources, and collaborating with student organisations (Greenwood & Levin, 1998).
3	Act	Execute the action plan by organising and conducting the proposed recreational activities. Ensure that all students are aware of the initiative beforehand through advertisements and announcements.
4	Observe and collect data	Gather data on student participation, engagement levels, satisfaction, and the impact of recreational activities on student living and learning (Stringer & Aragón, 2020). Data collection can occur through the following instruments: surveys and questionnaires, interviews and focus groups, academic performance analysis, observations and reflections, comparative studies, and longitudinal studies. These methods will be used to quantify students' satisfaction in subsequent Game Day activities.
5	Reflect and analyse	Reflect on the collected data to evaluate the effectiveness of recreational activities in promoting student engagement, well-being, and community building.
6	Revise and refine	Based on the analysis and feedback from the participating students, make any necessary adjustments or improvements to the recreational activities and their implementation.
7	Implement again	Re-implement the revised plan, considering the insights gained from the previous cycle of action research.

By following this action research plan, the Chemical Engineering Department can systematically incorporate and evaluate Game Day activities, leading to continuous improvement and enhanced student experiences.

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