# **Conclusion/Discussion (1,000 words)**

This chapter addresses the limitations of the study, the challenges faced, and areas for future work.

## **Limitations of the Study**

Time constraints

Financial backing – could not use Firebase Cloud functions to automatically generate scores for the previous day at 00:01.

Available data on Irish carbon footprint emissions for specific activities – UK data was often used as a substitute

## **Challenges Faced**

Creating the scope for the project – what to include, what to dedicate to future work

Documentation writing – developing a coherent, integrated report, with each section connected throughout

## **Future Work**

Several areas exist for future work to further develop this application, areas which were not implemented due to time constraints of the project.

**Sign up functionality**

The author excluded functionality to sign up for an account because when a new user signs up, they would need to select, be placed in, or create a new team. Having a new user join an existing team risks disrupting the team dynamics, and adding complexities to how the team leaderboard would operate. Having the ability to sign up and create or select a team would satisfy the psychological need of autonomy, where the user feels in control, however, as outlined in the literature review, achievement and social gamification features have been proven to be extremely effective at satisfying the psychological need of autonomy, and with the time constraints of this project, the author ultimately decided sign up functionality to be an area for future work. The insights from the literature review highlighted that providing an environment to compete in, both individually and in teams, was the crucial aspect to satisfying the psychological needs of autonomy, competence and relatedness as outlined by the self-determination theory. How these teams are created is far less important, and as such, the sign up functionality was deferred.

Ability to edit or delete an emission log for the current day

Ability to quick add an emission log, such as your daily commute to work or your daily bowl of porridge for breakfast

Ability to create a team

Ability to join a team

Adding QR code scanner for logging food emissions such as the functionality provided in MyFitnessPal

Incorporate Firebase Cloud Functions to automatically generate scores for the previous day at 00:01 every day

Improve accuracy of the emissions from food and transport activities

Provide alternative scoring systems or additional ways to compete, potentially match play where 2 users compete head to head and the winner of each week gets 3 points, the loser gets 0, and if it’s a draw, both players get 1 point.

All of these areas for future work were considered at the beginning of this project, when determining the scope for this project, however, due to time constraints, the most value-adding functionality outlined from the literature review and requirements analysis was prioritised. The overall goal for this app was to provide a gamified, social mobile app where users can compete against others through their carbon footprint scores, and the author is satisfied this has been accomplished and catered for.