The Planning of the Fire Evacuation Routes for our School

1. Introduction

Fire evacuation routes are essential for survival in case of emergency. When there is a fire, we have to rely on the evacuation route in order to evacuate safely and orderly. In this project, we aim to plan the evacuation routes of our school as we would like to see if the existing routes can be further improved.

We started by taking measurements in the school. Next, we gathered the measurements and created 2 spreadsheets. In sheet 1, we included all venues, staircases and corridors to indicate the travelling time and the number of people that can evacuate along neighbouring venues in all possible routes. Sheet 2 is the planning for all routes and the calculation of the time needed for each route. At last, we will compare the planned routes of this project to the existing evacuation routes.

6. Comparison between the Actual Route and our Planned Route

The time used in the last 3 whole-school fire drills (which used the existing route planned by the school) are 6 minutes and 44 seconds, 6 minutes 14 seconds and 6 minutes 4 seconds. The average time needed is 6 minutes and 20 seconds.

After completing sheet 2, we have obtained that the time needed for our planned routes for the whole school evacuation is 56 units of time (from the route of room 804). Using the conversion of 6 seconds for 1 unit of time (the time for walking 10 steps), we would need 56 x 6/10 = 5 minutes and 36 seconds to evacuate the whole school, which is slightly less than the time needed for the actual evacuation planned by the school.

8. Reflection

The project is extremely meaningful and fruitful. We learnt more problem solving skills, such as trying to think from different perspectives in order to plan fire evacuation routes in a better way. Additionally, we found out that teamwork and cooperation are crucial in order to have agreements on how to improve with the existing evacuation routes. Even though we encounter obstacles in the process, encouragements from teammates can always keep us positive to continue with this surely satisfying experience. Finally, as S1 students, we have become more familiar with our school through planning the evacuation routes.

9. Reference

H. W. Hamacher, S. A. Tjandra. (2001). Mathematical Modelling of Evacuation Problems: A State of Art. Fraunhofer-Institut für Techno- und Wirtschaftsmathematik
https://kluedo.ub.uni-kl.de/frontdoor/deliver/index/docId/1477/file/bericht24.pdf