

Module – 2

Case-study-2

Case- “Optimizing the Performance of a Swimmer”

Four times Olympic Champion Alex said “*if you want to be a better swimmer, then swim*”. Then, “*How should one practice?*” would be the obvious next question. In this study, we have tried to find an answer to this question by means of an experimental analysis.

Performance of a swimmer is measured by the time taken by him to complete a particular distance. Our objective was to find out what factors affect the performance of a particular swimmer. We wanted to find the levels of these significant factors at which the swimmer takes the least time to complete swimming a particular distance. For our experiment, we chose the distance to be 25 meters. This particular distance of 25 meters was chosen because the experiment was performed in the Terrace Apartments swimming pool and the length of the pool was 25 meters. First of all, the pre-experimental analysis was done. We stated our problem, choose the factors, their levels and ranges and we selected the response (output) variable. After talking to a few people who practiced swimming regularly, it was observed that time of the day (morning or afternoon) influences performance of swimming. Taking food before or after swimming may also influence performance. The swimming pool, obviously, has two ends. The end that is deeper (about 8 meters usually) is called “Deep End” and the end that is not deep and is usually just one meter deep is said to be the “Far End”. The swimmer may either choose to start from either the *deep end* or the *far end*.

The swimmer may wear a swimming trunk and goggles for comfort or he may just wear some casual shorts. But we are not interested in this factor. This factor is controlled during experiment, and fixed. A heater controls the temperature of the water in the pool and so the experiment is conducted when the swimmer swam in the water at a constant temperature. The swimmer that we have selected can swim only in the “free style” way of swimming. So the entire experiment is conducted when the swimmer swims in “Free Style”. After noting down the time taken by the swimmer to swim for one end to the other for any particular treatment combination, he was allowed to rest for 15 minutes to regain the normal heart beat. Then the second reading was taken under same treatment combination. The whole experiment is restricted for a particular swimmer under investigation.

Can you recognize the problem statement, objective of the case study, identify experimental (design) factors, control factors, nuisance factor, response variable, and levels of all control factors?

