

Comparing Heart Rate to Improve an Exercise & Stretching Based Warm-Up Routine Using Student Feedback

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EcoliteracySCHOOL
Students Collaborating in Health-Oriented Outdoor Learning

Introduction

EcoliteracySCHOOL is a field experience that college and high school students undertake in the outdoors. My project was a hybrid warm-up routine based off student feedback from field experience 1 (FE1). My warmup will realistically prepare students for the field experience and injury prevention will come from helping students that indicate they are struggling or in need of help while on the hike. This preliminary research informed my initial warmup routine to compare a stretch based versus exercise based warm up. My second warmup routine was created based on student feedback and should increase performance and perceived attitude to the warmup.

Methods

This involved analyzing data from surveys and determining which stretches or exercises had the best feedback. After building the new hybrid warm-up I implemented it into field experience 2 (FE2). The goal was to create a warm-up that all students enjoy and a revision framework that can evolve with each field experience with student feedback repeatedly implemented each year.

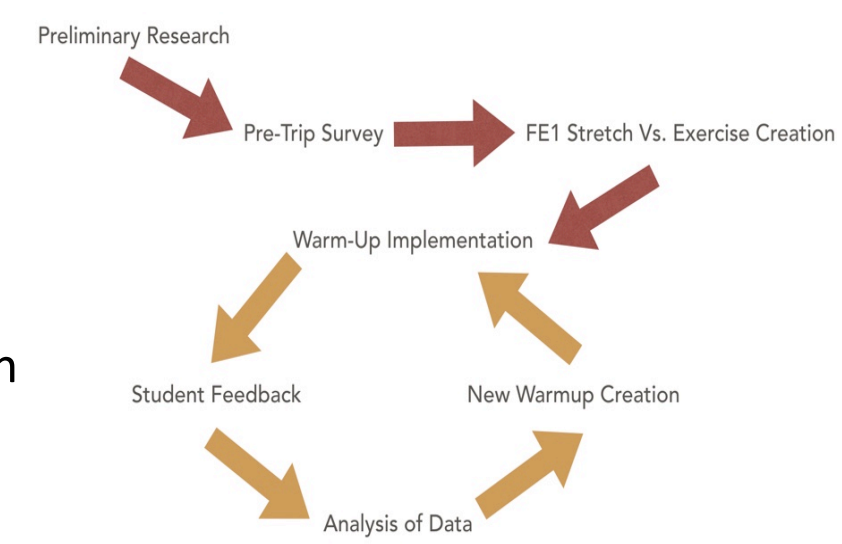


Fig. 1: Shows cyclical feedback loop for progressive improvement of warmup routine.

BWCA Hike:

- Stretching!
- High Lunge, Crescent
- Intense Side

Standing Forward Bend

Extended Side Angle Pose

EcoliteracySCHOOL Field Experience Data Sheet (Group 1)

- Gentleman's Hike Exercise!
- High Knees
- Jumping Jacks
- Lunges
- Core Stretch
- Arm Circles
- Quick Feet

Squats

Jumping Jacks

(Modified) Extended Side Angle

Should Stretch

Core Stretch

Upper Leg Stretch

Figs. 2-4: (Shown from left to right) Stretch-based warmup, exercise-based warmup and combined warmup.

Discussion

Implementation of the FE2 warmup routine was more beneficial than the FE1 one. Level of satisfaction from FE2 shows an increase compared to FE1. Heart rate from the FE2 warmup matched what preliminary research states is more conducive to prepare people for exercise. Every student indicated it was better than FE1 warmups and increase in the number of students indicating that implementing exercise or stretching into daily lives is beneficial. There were comments that specific exercises and stretches could be removed or added to further improve the routine. Ideally, I would also like to see the level of satisfaction even higher and this can be achieved in future iterations of the program by reworking of the routine.

Results



Fig. 5: Shows students participating in stretch-based routine at Tettegouche Park.



Fig. 6: Shows students participating in a combined warmup routine at White Water Park during field experience 2.



Fig. 8: Shows students participating on a hike at White Water Park during field experience 2.

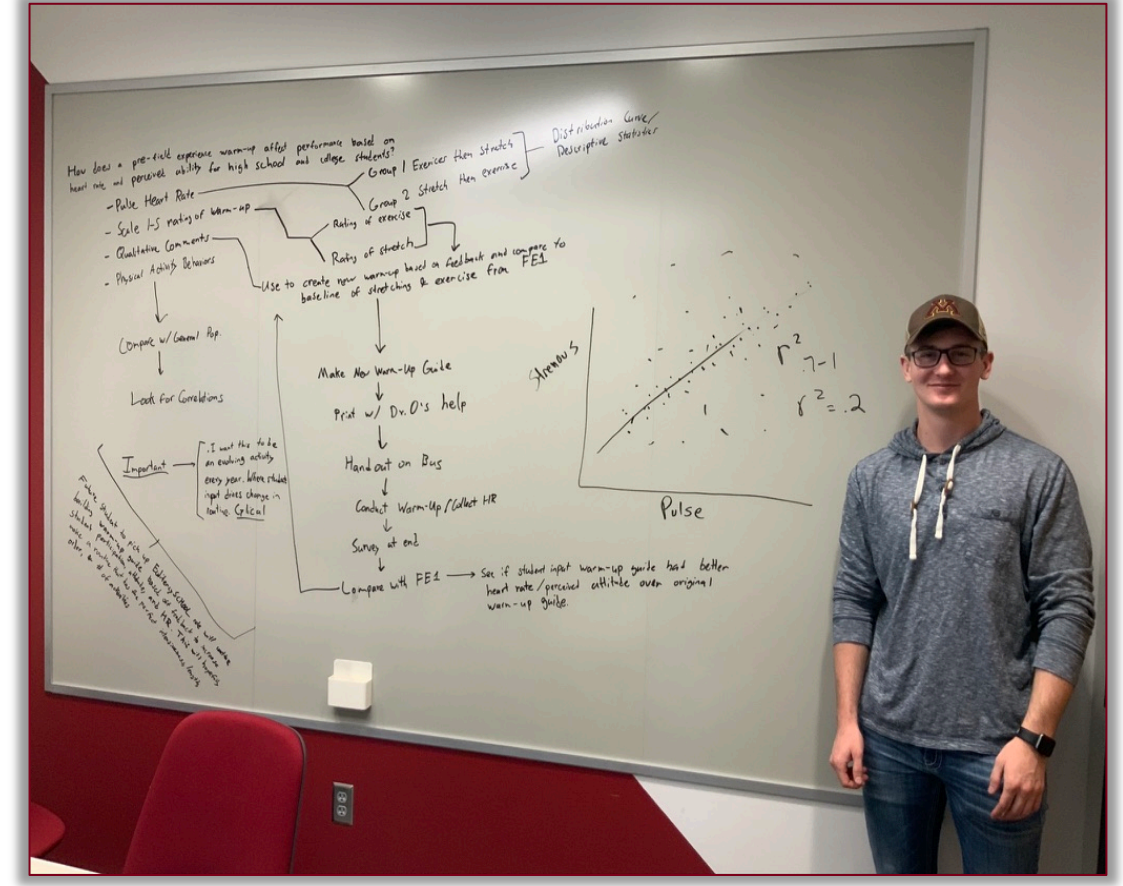


Fig. 11: Working out ways to collect data, analysis, and create a cyclical improvement method.

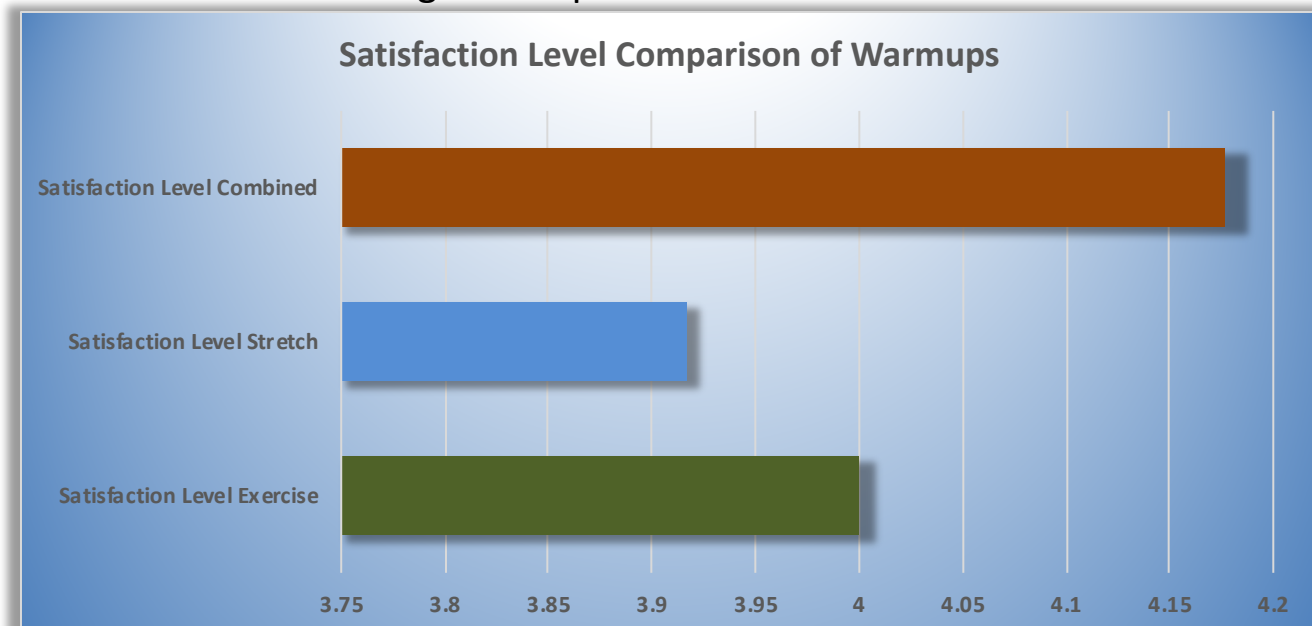


Fig. 9: Shows the average satisfaction level of each warmup routine.

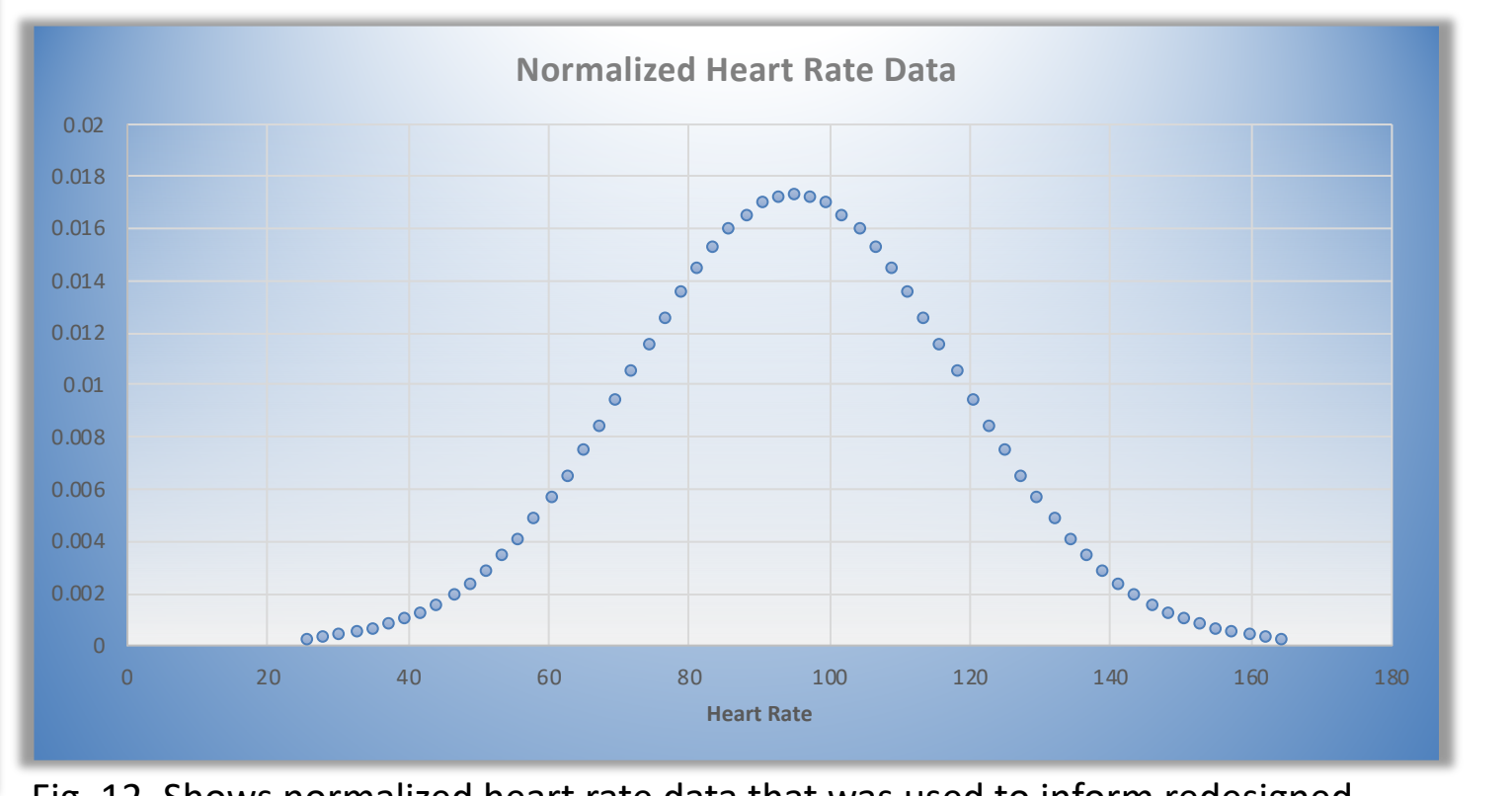


Fig. 12: Shows normalized heart rate data that was used to inform redesigned warmup routine

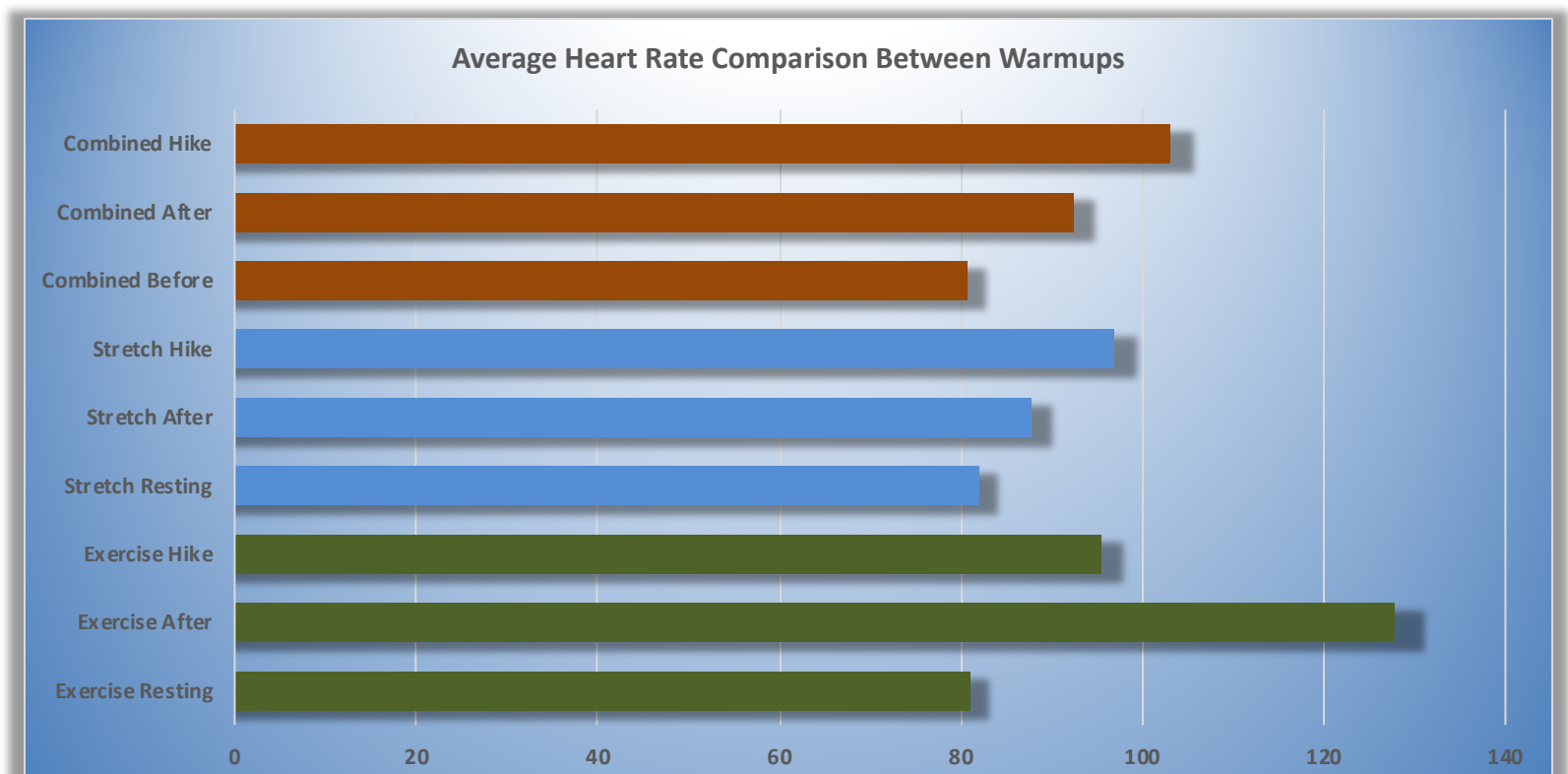


Fig. 7: Show the average heart rate before warmup (resting heart rate), after warmup, and during hike.

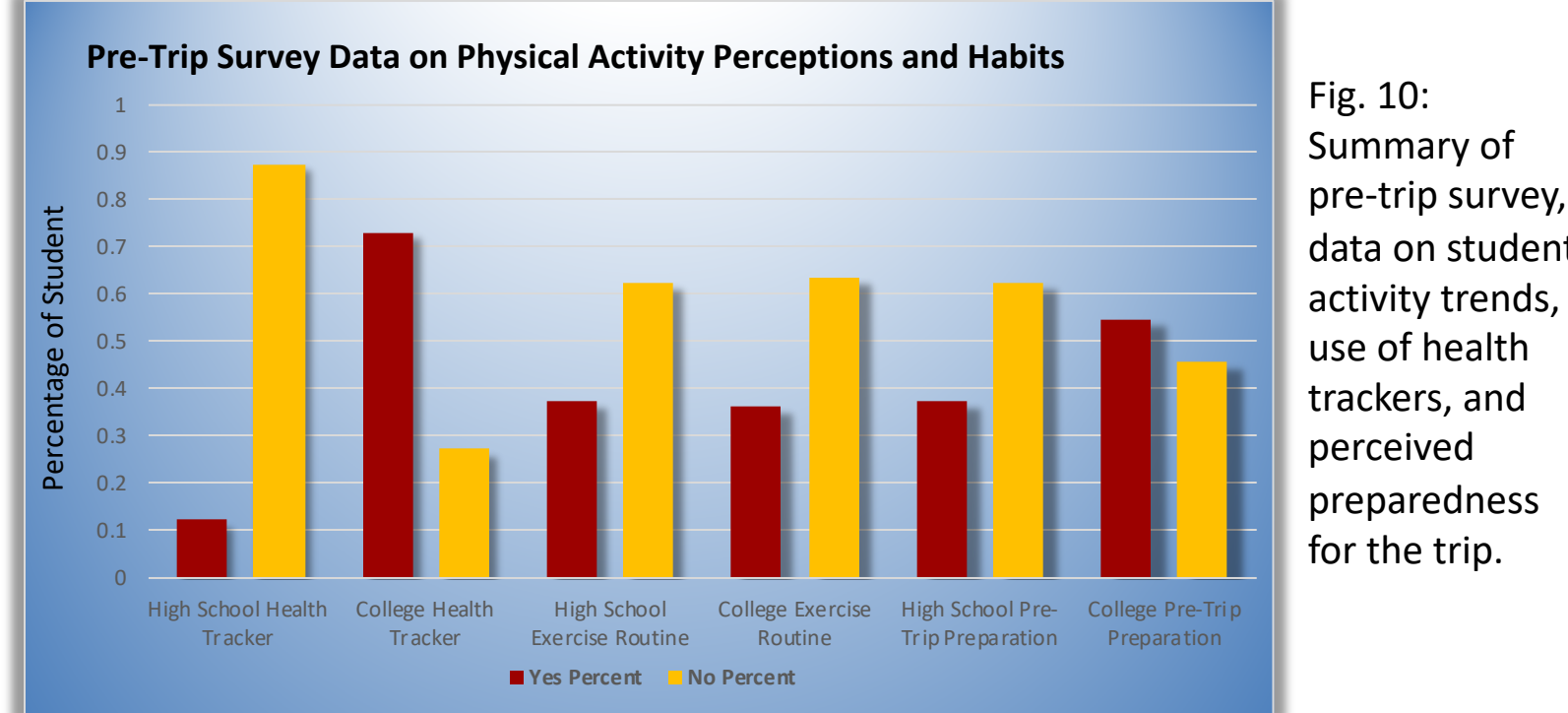


Fig. 10: Summary of pre-trip survey, data on student activity trends, use of health trackers, and perceived preparedness for the trip.

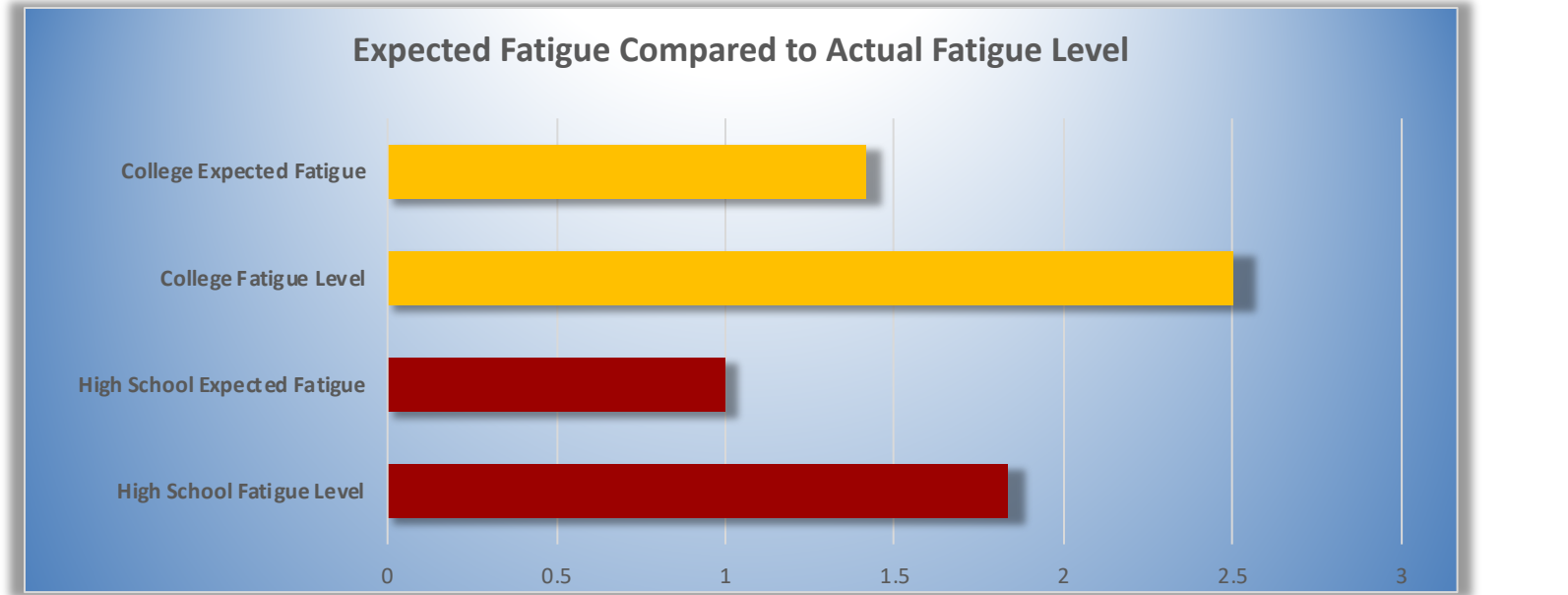


Fig. 13: Shows expected versus actual fatigue level by college and high school students.

Future Directions

In the future students could wear health trackers for the duration of the trip and could include heart rate, O2 levels, respirations, calories burned, geographical tracking, elevation, steps taken, and perspiration. Data could pinpoint areas of overexertion and rest stops could be implemented based on this data. There could be a pre-trip exercise routine to prepare students for the hikes and intensity of the hikes in addition to warmups. Exercise equipment could be implemented if it doesn't overburden students.

References

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- Article 5: J Matt McCrary, Bronwen J Ackermann, Mark Halaki, *A systematic review of the effects of upper body warm-up on performance and injury*, BMJ Journals, 2015