



Energy in Motion

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An explanation of why WPI should invest in energy-generating exercise machines in the new athletic center

Abstract

In a gym or exercise facility, the kinetic energy produced can be is often not utilized. This study seeks to harness this wasted motion by using energy generating exercise bikes and/or elliptical machines in the new athletic facility at WPI. Energy generating exercise machines can be beneficial, by reducing the energy footprint of the new facility by power light fixtures, as well as educating the WPI community on energy generation.

Data

	Exercise Bikes	Elliptical Machines
Cost Difference	\$49.88 (more expensive)	\$2561.55 (less expensive)
Usage per Day	13 hours	21 hours
Average Generated Watts per Hour	180 Watts	120 Watts
	↓	↓
Cost of Energy Saved per Year	\$71.92	
Lights able to be powered per day	16 (12 Watt DC powered Lights)	

Promotion Ideas



- An energy meter that displays the electricity being generated
- A weekly calendar and count of the energy being generated
- A competition to see who can generate the most energy in a certain amount of time
- A posted count of the number of the different participants
- Other

Project Goals

To examine the **effectiveness of installing energy generating exercise machines** in WPI's planned athletic facility and **encourage their use.**

Public's Point of View

Psychological effects to overcome:

- ✓ Sparking initial excitement and generating interest over new machines
- ✓ To keep the machines from becoming a novelty that people will use sparingly

Possible ideas to promote new machines:

- ✓ Display a meter showing the amount of energy generated
- ✓ Hold an energy generating competition to excite people about the new machines with an incentive

Example of the Team Dynamo system.

HumanDynamo.com



Potential Energy in Gyms

- ✓ Energy is typically used to operate a gym, but rarely do gyms look to produce their own energy
- ✓ Many aspects of gyms require energy to work effectively, such as exercise machines, showers, and fans.
- ✓ There are limited options for human energy generation in order to power facilities.
- ✓ 12 college athletic facilities in the ReRev program take advantage of human generated power.
- ✓ There is a large potential to utilize human generated energy in order to power part of the WPI athletic facility.

WPI's Future Athletic Facility
sportsandrecreation.wpi.edu



Conclusions

The implementation of the energy-generating exercise machines is highly feasible, as well as beneficial to the WPI community in various ways.

This plan calls for:

- ✓ the installation of 20 machines, integrating them into the floor space of the exercise facility.
- ✓ the electric power generated will charge a battery bank, which will power nearby lighting fixtures
- ✓ the lighting will consist of LED-based arrangements that are run on DC electric power, making the entire process highly efficient