Increasing Motivation through Showing Relevance to Studies

Martin Strangwood
The University of Birmingham,
Sports Materials Research Group
School of Engineering, Metallurgy and Materials
Steady decrease in applicants for traditional accredited courses

Corresponding rise in popularity of Sports Science-based degrees

Hybrid degrees combining Sports and Exercise Sciences with Materials / Mechanical Engineering
Students have Biology or PE ‘A’-levels
Other subjects are widely varying from Maths, Physics or D & T to Social Sciences, Geography, History
Play a range of sports with Hockey, Football, Cricket, Golf, Cycling, Tennis and Swimming being most popular
Advanced material design

- Non-traditional shape
- Monocoque design needed to benefit from properties of fibre composites
- Changed design modifies cycling style
- Costly and poor damage tolerance
Persistent difficulties

- ‘Engineering’ concepts, e.g. mechanics and materials properties
- Relevance of above to Sports Science
- Dryness of traditional methods of teaching, e.g. tensile testing and bending moments
Design and build

- Group activity to tap into mixed abilities / skills
- Relate to sports that they play
- Competitive aspect
- Multiple components and assessments including embedded ‘Engineering’ to keep mixed groups active
The ‘Stimpmeter’ challenge

- Stimpmeters measure the speed of golf greens
- Expand this to ask question ‘Do balls roll further on artificial or real pitches’
- Choice of balls available covering sports that students play
- Need to design and build reliable launcher – portable and durable
- Materials and facilities provided
Planning

Physics’
tiffness
tensity
urability

Planning – exercise took first three weeks of term with testing days booked and need to produce poster and draft
Construction
Testing
Model Snowboarders

- End of first year, build a model snowboarder
- Base selected from various sheet metals
- Characterise as-received sheet—embedded hardness and tensile testing and metallography
- Competitive

- Metal shaping, heat treatment and joining
- Gapped hand-out to replace lab. write-up so that can carry out testing in future
- Analyse performance and come up with improved design