Engaging a Multidisciplinary Group of Students in Wind Energy Education through the Planning and Execution of a KidWind Challenge at James Madison University

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\(^4\) School of Hospitality, Sport and Recreation Management; Hospitality Management Program

For: North American Wind Energy Academy 2015 Symposium
Virginia Tech - Blacksburg, Virginia, June 10, 2015

4A: Panel Session: Workforce Development & Education
A public regional university located in Harrisonburg, VA

~20,000 students across all academic programs with
~1,700 enrolled within a graduate program
CENTER FOR WIND ENERGY
Located at James Madison University

Focuses on research, education & outreach pertaining to wind, solar and energy efficiency

Serves the entire Commonwealth of Virginia and engages stakeholders at local, state, regional & national levels
CrEATE a KidWind Challenge Event Course

Collaborative Educational Activities that are focused on Technology for renewable Energy

A course constructed to be an educational experience for students and faculty from multiple disciplines in teams to design, prototype, implement, manage and execute age appropriate educational activities for K-12 students during the East Coast Regional KidWind Challenge Event.
MOTIVATION

Avenue to gain understanding about a structure of an enterprise

Opportunities to discover broader applications of the disciplines through the renewable energy platform

An endeavor that fosters an enhanced sense of civic responsibility
OVERVIEW

Project funded Course - 4VA JMU Challenge - Dominion Virginia Power

CISE level course

Disciplines sought/participated Education, Psychology, Hospitality, Engineering, ISAT

Project based learning, experiential learning
  10 big questions from KWC rule book
  Mock KidWind Challenge

Non-profit business canvas
To provide opportunities for students to:

Apply academic knowledge and skills within a “real world” setting

Improve leadership skills

Enhance connection to professional responsibility

Establish effective working relationships with supervisors, peers, and others

Expand view of multiple disciplines in terms of community engagement

Engage personally with new communities and in self-regulated learning
Students will be able to:

Work toward solutions of student-identified issues within the framework of the KidWind Challenge

Work outside of disciplinary boundaries on multidisciplinary teams

Demonstrate and apply discipline related knowledge to multidisciplinary issues

Explore environmental, economical, technical and societal dimensions in regards to the KidWind Challenge Event
Course Structure

- Organizational Structure
- Mock KidWind Challenge
- Event Planning

Kenn Barron, PhD
Professor
Psychology

Reg Foucar-Szocki, PhD
Professor
School of Hospitality

David Slykhuis, PhD
Associate Professor
College of Education
Organizational Structure

- Individual and Group Business Canvas
- Organization Name and Mission Statement
- Identify Committees
- Interview Students and Place on Committees
The Non-profit Business Model Canvas

CrEATE Class – group canvas

Key Partners
- KidWind
- Dominion
- JMU
- Other 4VA universities
- 4VA
- CrEATE class
- Wind Industry
- Emergency Services
- Outreach and Engagement

Key Activities
- Planning and logistics
- Activities and exhibits
- Communications and promotions
- How To Manual
- Assessment

Key Resources
- Money
- Location
- Research
- Time
- Labor available
- Expertise

Value Proposition
- Educating students on renewable energy in an engaging way that reflects positively on JMU

Relations
- Good relations with Dominion
- With KidWind
- JMU with KWC
- Class with 4VA universities
- Teams with KidWind
- Class with teams

Co-creators
- JMU
- K12 students
- University students
- K12 teachers/coaches
- Wind Industry
- Dominion

Channels
- Website
- Social media
- phone/groupme
- Email/listserv
- Youtube videos
- Webinars

Value-streams: outlay and costs
- Time
- Cost of resources
- Prizes
- Note: we have $4000 for this Challenge!

Value-streams: returns
- More students in CrEATE class next year
- Leadership
- Teamwork
- Students to JMU
- More students in wind energy majors/jobs
- Have fun!
- Awareness about wind/renewables

GOALS: Education, entertainment, and recruitment!
Mock KidWind Challenge

Overview of KidWind Challenge and Rules

Research Phase – Investigation Stations

Design Phase – Prototyping and Modifying

Challenge and Judging
Event Planning

**About the Hosts**

KidWind is hosted by the Department of Energy and Environment at JMU.

**Activities & Tours**

All activities are 45 minutes long and are offered at 1:30 pm, 2:30 pm, and 3:30 pm.

Each tour will be a guided tour of the KidWind exhibits and the KidWind Challenge Regions at JMU.

**Egg Drop Instant Challenge**

Location Room 244

During this activity, students will design and construct an egg drop capsule that will protect a raw egg from a 20-foot drop. Students will be provided with materials to create their own egg drop capsules.

**Schedule of the Day**

<table>
<thead>
<tr>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 AM</td>
<td>Room 244</td>
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<tr>
<td>9:30 AM</td>
<td>Room 244</td>
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<tr>
<td>10:00 AM</td>
<td>Room 244</td>
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<tr>
<td>11:00 AM</td>
<td>Room 244</td>
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<tr>
<td>12:00 PM</td>
<td>Room 244</td>
</tr>
<tr>
<td>1:00 PM</td>
<td>Room 244</td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Room 244</td>
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</table>

**Keynote Speaker**

Charles Johnson is a 2012 graduate of the IIT program at James Madison University. He is currently employed as a Development Manager for Apex Clean Energy. Charles works to develop wind projects located in the KidWind Region.

**Committee Mission Statements**

KidWind is committed to... (ミッションステートメント)

**Committee Guiding Documents**

KidWind is guided by... (ガイドライン)

**Staff Meetings**

KidWind staff meets... (スタッフミーティング)

**KidWind Challenge Regionals at JMU**

KidWind Challenge Regionals at JMU... (キッドウィンドチャレンジ リージョナルス アット ジェイエムエイ)

**Committee Reports and Presentations**

KidWind committee reports and presentations... (コミミットメントレポートとプレゼンテーション)

**Challenge Judges**

Richard Morgan, P.E., wind energy specialist

Ellis Wooten, F.A.EE., association of energy conservation professionals

Diane Serafin, JMU student and wind energy enthusiast

Heather Lee, JMU Engineering Department head

Kristy Stiehler, renewable energy researcher

Linda L. Smith, Lihui Tang, Jenny March, suspect

**Center for Wind Energy**

The Center for Wind Energy at JMU hosts a demonstration wind turbine and facilities for on-campus education and research. Participants will learn about wind energy and its applications for residential and commercial use. The center features a demonstration wind turbine and facilities for research and education.

**KidWind Vision**

KidWind is a program designed to... (ビジョン)

**KidWind Mission**

KidWind's mission is to... (ミッション)

**KidWind Objectives**

KidWind's objectives are to... (オブジェクトリ

**KidWind Goals**

KidWind's goals are to... (ゴール)

**KidWind Challenges**

KidWind challenges students to... (チャレンジ)

**KidWind Success Stories**

KidWind has achieved... (成功事績)

**KidWind Regional Programs**

KidWind has established... (リージョナルプログラム)

**KidWind Regional Events**

KidWind regional events include... (リージョナルイベント)

**KidWind Regional Partners**

KidWind regional partners include... (パートナーシップ)

**KidWind Regional Funding**

KidWind regional funding is provided by... (財源)

**KidWind Regional Volunteers**

KidWind regional volunteers include... (ボランティア)

**KidWind Regional Alumni**

KidWind regional alumni include... (アリュミナシオニ)

**KidWind Regional Interns**

KidWind regional interns include... (インターン)

**KidWind Regional Supporters**

KidWind regional supporters include... (サポート)

**KidWind Regional Supporters**

KidWind regional supporters include... (サポート)

**KidWind Regional Supporters**

KidWind regional supporters include... (サポート)

**KidWind Regional Supporters**

KidWind regional supporters include... (サポート)
Virtual Tour

KidWind Eastern Regional Finals: April 25th, 2015
Assessment Results

**Attitude - Results**

Lower is better

**Context - Results**
Assessment Results

**Attitude - Results**

- **Higher is better**

**Context - Results**

- **Higher is better**
Assessment Results

### Attitude Results

<table>
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<tr>
<th>Question</th>
<th>Pre-Test</th>
<th>Post-Test</th>
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<tbody>
<tr>
<td>unattractive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lower property values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>noise</td>
<td></td>
<td></td>
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<tr>
<td>flicker</td>
<td></td>
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<td>birds</td>
<td></td>
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<tr>
<td>bats</td>
<td></td>
<td></td>
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<tr>
<td>not cost effective</td>
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<tr>
<td>not help economy</td>
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<tr>
<td>take up land</td>
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<tr>
<td>developers don’t listen</td>
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<td>important</td>
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<tr>
<td>increase amount</td>
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<tr>
<td><strong>Average Score</strong></td>
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### Context Results

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<tr>
<th>Question</th>
<th>Pre-Test</th>
<th>Post-Test</th>
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<tbody>
<tr>
<td>Most elec generation</td>
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</tr>
<tr>
<td>Wind powering homes</td>
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<td></td>
</tr>
<tr>
<td>1MW power s homes</td>
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<tr>
<td>largest barrier</td>
<td></td>
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<tr>
<td>Biggest variable</td>
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<tr>
<td>wind speed at height</td>
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<tr>
<td>blade variable</td>
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<tr>
<td>not a turbine style</td>
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<tr>
<td>yawning</td>
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<td>what kills most birds</td>
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<td>Hub</td>
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<tr>
<td>Nacelle</td>
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<tr>
<td>Where put turbine on map</td>
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<tr>
<td><strong>% Correct</strong></td>
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Recommendations

Challenge Participant Surveys:
- Make sure wind tunnels put out the same wind speed
- More and larger variety of STEM activities
- Longer time for testing and judging – time marshall
- More room for team tables
- Tours for older kids

Committee Recommendations:
- Start planning earlier
- Pre-survey to teachers to understand what they want out of event
- Parent/Teacher/Coach lounge – with coffee
- Meals for volunteers
- Market activities better
- More tasks for Communications Committee
- Recruit volunteers earlier

Executive Board Recommendations:
- Use MS Project
- More science throughout
- Structure telecons better
- Include Ed/Psych students
THANK YOU &
QUESTIONS?
STUDENT ORG. PARTICIPATION

ACS
NSBE
SANCAS