Service and Experiential Learning: A Look at Some of the How’s and Why’s

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Business Development Program
MU Extension

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Overview

➢ Background ("why")
  • Needs in Missouri (focus on rural areas)
  • Citizen Expectations
  • Student, faculty, and university benefits

➢ Example #1: Experiential Learning Course ("how")

➢ Strategies, Resources and Additional Examples

➢ Idea Generation: Science and Engineering

➢ Goal: Get You To Think About Ways To Do This
Some Recent Headlines

RURAL AMERICA IS THE NEW ‘INNER CITY’

A Wall Street Journal analysis shows that since the 1990s, sparsely populated counties have replaced large cities as America’s most troubled areas by key measures of socioeconomic well-being—a decline that’s accelerating.

By Janet Adamy and Paul Overberg

THE CHRONICLE OF HIGHER EDUCATION

A DYING TOWN

Here in a corner of Missouri and across America, the lack of a college education has become a public health crisis.
Other Recent Headlines

**The New York Times**

*A Peek at Future Jobs Shows Growing Economic Divides*

By BEN CASSELMAN  OCT. 24, 2017

In much of the South and Midwest, a large share of the population works in fields where employment is expected to decline by 2026. Above is the share of employed residents who work in shrinking occupations, by county.

**Prosperity and distress**

2017 Distressed Communities Index scores

Economic Innovation Group (eig.org)
# Challenges: A Look at Missouri

<table>
<thead>
<tr>
<th>Health, Educational, Income and Employment Factors</th>
<th>USA</th>
<th>Missouri</th>
<th>Southeast MO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity</td>
<td>27.5%</td>
<td>30.3%</td>
<td>32.5%</td>
</tr>
<tr>
<td>Smoking Rate</td>
<td>21.2%</td>
<td>23.0%</td>
<td>27.5%</td>
</tr>
<tr>
<td>Life Expectancy</td>
<td>78.1 years</td>
<td>76.9 years</td>
<td>75.2 years</td>
</tr>
<tr>
<td>Infant Mortality Rate (/1000 lb)</td>
<td>6.7</td>
<td>7.3</td>
<td>8.0</td>
</tr>
<tr>
<td>Depression</td>
<td>17.5%</td>
<td>20.6%</td>
<td>23.0%</td>
</tr>
<tr>
<td>Percentage with Disability</td>
<td>10.2%</td>
<td>12.4%</td>
<td>17.9%</td>
</tr>
<tr>
<td>H.S. Degree/Advanced Degree</td>
<td>86.5%</td>
<td>87.0%</td>
<td>78.0%</td>
</tr>
<tr>
<td>Per Capita Income</td>
<td>$47,699</td>
<td>$43,425</td>
<td>~ $33,000</td>
</tr>
<tr>
<td>Unemployment Rates</td>
<td>3.7%</td>
<td>3.2%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Poverty Rates</td>
<td>15.2%</td>
<td>15.8%</td>
<td>21.5%</td>
</tr>
</tbody>
</table>
Summary: Challenges of Rural Areas

- Lower per capita and median family income
- Economic opportunity (jobs and wages)
- Health, opioid addiction, mental health
- Infrastructure limitations
  - Transportation and internet
- Loss of youth
  - Brain drain (intellectual capital)
  - New knowledge and skills
  - Risk takers
Public Expectations

We are a land-grant university

- Institutes of learning that focus on practical agriculture, science, military science, and engineering.
- An innovative way of supporting the country through economic growth in key fields like agriculture, science, and engineering.
- Provide residents of all social classes a chance to better their station in life through higher education.

UM System vision statement: “Our vision is to advance the opportunities for success and well-being for Missouri, our nation and the world through transformative teaching, research, innovation, engagement and inclusion.”
Service and Experiential Learning

Faculty and University Benefits

**Faculty**
- Focus on real world problems in teaching
- Creation of more effective learning environment
- Innovative – promotes student participation better than typical lecture format

**University**
- Greater engagement with those we are here to serve
- Mission and vision attainment
Student Benefits

- Enhanced workforce readiness through improved understanding of today’s challenges
- Unique learning environments promote understanding between course materials and real world problems (employment readiness)
- Promotes lifelong service in the individual
What’s an Engineer To Do?

- Generate idea or concept
- Identify approach
  - How?
  - Pivot if necessary
- Recruit partner(s)

Note:
- Generally, fewer courses in engineering with service or experiential learning components.
- Typically, more in the humanities and social sciences
Concept: Create an Experiential Learning Course in Rural Tech Entrepreneurship

- **Why? Help rural Missouri**
  - Address brain drain issue
  - Find ways to create local tech-related jobs
  - Provide unique experience for students to work
  - Build university – community partnerships
  - Build interest in college attendance (long-term)

- **ECON/EMSE 3001 – Advancing Innovation in Rural Economic Ecosystems**

- **Partners**
  - Bonnie Bachman
  - Caprice Moore
Nature of S&T – natural fit with STEM innovations

Pitched concept to VentureWell
https://venturewell.org/
  • Mission – “We envision a world in which science and technology innovators have the support, training, and access to networks and resources they need to solve the world’s most difficult problems.”

Proposal funded in February 2018: $28,000
  • Majority of funds targeted toward student use for project supplies
  • Minimal support for faculty time
Use Affordable and/or Open Educational Resources

Resources reviewed and obtained

- Copyright permission to use the excellent materials from the Center for Rural Entrepreneurship (Lincoln, NE; Don Macke)
- Other materials from USDA, US EPA and other sources

Settled on:

- Business Model Generation ($20 text; Osterwalder & Pigneur)
- Udacity (videos)
- Resource bank
- Focus on right hand side of canvas (value prop customers)
ECON/EMSE 3001 Concept

- S&T students recruited to participate in the course
  - Advance their own innovation or idea closer to commercialization working in a rural community (potentially, their own hometown)
  - Students can also work on project identified by host community
  - Students can carry out local entrepreneurship ecosystem mapping (if needed)

- Local community hosts recruited
  - Facilitate student progress on their innovations
  - Provide an effective immersive environment
  - Make local connections to key players in the local E/ED system

- Course is student-driven
Joan Schuman introduced me to Bonnie Prigge, Executive Director, Meramec Regional Planning Commission

Bonnie shared flier regarding course with other communities around state

Conference attendance

Able to identify six rural communities interested in hosting students
ECON/EMSE 3001 Course Aspects

Student Recruitment

- Worked with Tim Albers, Interim Director, Enrollment Management, to identify S&T students from rural areas
- ~525 students from rural MO
- Posted flier
- First offering:
  - 5 students
  - 3 communities: St. James, Rolla, Burlington, IA

*** New Course ***

ECON 3001 / ENG MGT 3001
Advancing Innovation in Rural Economic Ecosystems
Summer 2019 – On-line
3 Credits

Do You Have an Innovation You’d like to Advance?
Do You Want to Learn More About Rural Economic Development?

Engineering Majors – ENG MGT 3001
- Receive Technical Elective Credit
- Enroll in Class # 71239/71240

Economics, Science and Non-Engineering Majors – ECON 3001
- Enroll in Class # 71237/71238

Course Details:
- Up to $2,000 in project support (funded through a grant from VentureWell)
- An experiential learning course to move your innovation toward commercialization
- Get practical advice and access to resources on tech innovation
- Host communities that will assist you have been identified
- Get to work with local business leaders who will serve as mentors
- Learn more about business building in a rural setting

Questions – contact:
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ECON/EMSE 3001 Delivery

- Efforts prior to the first day of class
  - Agreement with students
    - Project scope and focus
    - Awarding of funding for STEM-related projects
    - Discussion of level of professionalism expected
  - Agreement with communities
    - Expectations – connections and host responsibilities
    - Student work hours (desk sharing)

- Used Canvas CMS (true facilitation tool for distance)
- Calls (Zoom possible, but not used)
- Periodic face-to-face meetings
  - Community hosts
  - Individual mentoring sessions with students
# ECON/EMSE 3001 Chronology

<table>
<thead>
<tr>
<th>Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 2017</td>
<td>Bonnie suggests joint appointment in Economics</td>
</tr>
<tr>
<td>October 2017</td>
<td>Discussions among team members of course concept and pitching idea to VentureWell</td>
</tr>
<tr>
<td>November 2017</td>
<td>Proposal submission to VentureWell</td>
</tr>
<tr>
<td>January 2018</td>
<td>Notification of grant funding (July 1, 2108 start date)</td>
</tr>
<tr>
<td>Summer 2018</td>
<td>Course development (continues through May 2019)</td>
</tr>
<tr>
<td>Fall 2018</td>
<td>Community recruitment, obtain rural student information, submission of EC course approval forms, partner engineering department identified</td>
</tr>
<tr>
<td>Spring 2019</td>
<td>Course approved and posted via flier</td>
</tr>
<tr>
<td>Summer 2019</td>
<td>Course offered (5 students enrolled)</td>
</tr>
</tbody>
</table>
Unmanned Aerial Vehicle (UAV) for Precision Agriculture, Livestock Counting and Mapping services

Jasser Estrada, Econ 3001
World Market

- Board game designed to increase classroom participation
# ECON/EMSE 3001

**Student Project # 2: Suzy Young – BMC**

<table>
<thead>
<tr>
<th>Key Partners</th>
<th>Key Activities</th>
<th>Value Propositions</th>
<th>Customer Relationship</th>
<th>Customer Segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Game manufacturer</td>
<td>Game creation Playtesting Curriculum writing Video lesson creation</td>
<td>Makes class more fun Gets students away from phones Includes pre-made curriculum to save teachers time Active learning Decision making skills Economic concept education</td>
<td>Work with educators for conference spots. Present research on the effectiveness of games. Offer free trials to social studies departments. Take feedback on how teachers are using the game. How well did it teach the concepts?</td>
<td>Younger social studies teachers in public schools that teach 8th-11th grade Parents with older children that want to be involved in student education Homeschool parents interested in more group learning Late Middle School or Early Highschool Students 8th -11th grade</td>
</tr>
<tr>
<td>Print shop</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum seller</td>
<td>Boardgame shops</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homeschool groups</td>
<td>Economics and Social Studies teachers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video recording specialist</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Resources</th>
<th>Channels</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Network of educators Playtesting groups Economics and finance expertise Video recording equipment</td>
<td>Education conferences Parenting magazines Homeschool co-ops Email campaigns Teaching Forums Educational material Sharing sites Social Media</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost Structure</th>
<th>Revenue Streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Game manufacture Distribution to conferences and shops Play testing facility and group Advertisements at conferences and in magazines</td>
<td>Curriculum and game purchase by schools Game purchase by boardgame shops Curriculum and game purchase by curriculum shops and homeschool co-ops</td>
</tr>
</tbody>
</table>

[www.businessmodelgeneration.com](http://www.businessmodelgeneration.com)
ECON/EMSE 3001 Takeaways

- Would encourage students who enroll to enter course with some background in entrepreneurship
- Only students with STEM innovations received funding, but course also suited to non-STEM innovations and entrepreneurs
- Need to start student recruitment earlier
  - Students enrolled in course because of need for upper level Economics course or technical elective
- Retain host evaluation of student performance and progress
- Would add student evaluation of host community
- Beneficial first run with smaller class
- Great partnership vehicle!
- Would definitely do this again!!
Opportunities
Community Capitals Framework

How to Use?
• Partnerships
• Ways to impact
• Community strengths and needs
• Foundation to carry out service learning effort
• Each community is different

Source: Community Capitals Framework & Sustainable Communities, Cornelia Butler Flora, Rural Studies Research Seminar, July 4, 2006, University of Guelph
Overcoming the Challenges of Working Rurally

Building Partnerships

- Colleagues/peers with existing relationships and reputation
- MU Extension
  - 114 counties and the city of STL
  - County Extension Specialists (CES)
- Regional Planning Commissions and other agencies
- Non-profits (VentureWell and many others)
- Utilities/electric co-operatives
- Local industry (untapped potential)
Missouri and MO Industry

- 183,333 employers in Missouri (2016 MO DED data)
- 450,000 businesses
- 74% of workforce employed by companies with less than 250 employees
- Missouri – approximately 2 million rural residents
  - 25 – 44 year old population sector decreasing at 3x the national average (Missouri Chamber of Commerce Report – 2030 Plan)
Overcoming the Challenges of Working Rurally

**Communication**

- **Travel**
  - At least initially, need to build partnerships face-to-face
  - Benefit of continuing partnership by your presence (boots on the ground)
  - First hand knowledge of community and players that can help facilitate partnership and service learning opportunities

- Consider need for broadband, cell coverage
Resources

➢ The experts – on-campus
  • Joan Schuman
  • CAFÉ programs
  • Others who have done service and experiential courses; ask around

➢ Other institutions
  • MU Office of Service Learning
  • University of Wisconsin-Eau Claire Service Learning

➢ Conferences
  • International Association for Research on Service Learning & Community Engagement
  • S&T and many other campus-level conferences

➢ NSF – increasing focus on Broader Impacts (Dr. Eva Campo)
Other Examples – Joan Schuman
Out of ~ 220 Service Learning Projects!

- County ADA Transition Plan for Main Court House and Annex Building
- Fire Station at Fairgrounds
- Vet Clinic and Animal Shelter at Where Pigs Fly Farm
- Energy Usage for County Buildings
- Walking Trails in the City of Linn
- 4th Street redesign in Salem
We advance the public purposes of over 1,000 colleges and universities by deepening their ability to improve community life and to educate students for civic and social responsibility.
Resources – Available Data

- MO Department of Health and Senior Services
- MO Department of Natural Resources
- MERIC – Missouri Economic and Research Information Center
- US Census
- US Department of Agriculture
- US Economic Development Administration
- MO Chamber of Commerce
- Local Chambers and Economic Development Specialists
Approach(es)

- Dependent upon goals
- Project/concept identification
  - Community driven
  - Faculty driven
- Can do something similar to Joan or I (or many others)
- Alternative spring breaks
  - Part of a class
- Through on-line classes
  - With on-line students working locally in their own communities
- Undergraduate research
- Link to building a culture of service
Idea/Concept Generation
Grand Challenges for Engineering

The National Academy of Engineering

- Make solar energy economical
- Provide energy from fusion
- Develop carbon sequestration methods
- Manage the nitrogen cycle
- Provide access to clean water
- Restore and improve urban infrastructure
- Advanced health informatics
- Engineer better medicines
- Reverse-engineer the brain
- Prevent nuclear terror
- Secure cyberspace
- Enhance virtual reality
- Advance personalized learning
- Engineer the tools of scientific discovery

Engagement opportunities in bold
NAE Grand Challenges and Rural Missouri

- Solar energy
  - Engineering
  - Adoption

- Topsoil retention and health (the nitrogen cycle)
  - Historic droughts and flooding

- Clean water access (flooding)

- Health informatics (Rural Health Information Hub)

- For each of the above: policy and sustainability issues

https://energy.mo.gov/resources/solar
https://www.ruralhealthinfo.org/topics/health-information-technology
Large Projects in Rural Areas

East Locust Creek Reservoir

ELCR Acquisition Status as of April 29, 2015

Acquisition Status
- Acquired
- Under Contract
- Offer Under Discussion
- Dormant Offer
- Waiting on Title Issues
- Acquired - Transferable
- Normal Pool
- Remnant Parcels to Be Negotiated
- Remnant Parcels Likely to be Acquired
- Remnant Parcels That Have Been Sold

Water Rates as a Percent of County Median Household Income

Legend
- East Locust Creek Reservoir
- ELC Reservoir 10 County Service Area
- Lower Grand HUC-8 - OMRI Pilot

Water Rate as Percentage of County MHI
- No Data
- Average Water Rate 0 to 0.5 % of County MHI
- Average Water Rate 0.5 to 1.0 % of County MHI
- Average Water Rate 1.0 to 1.5 % of County MHI
- Average Water Rate 1.5 to 2.0 % of County MHI
- Average Water Rate Greater Than 2.0% of County MHI

Average Water Rate from MRWA 2012 Rate Survey
County MHI from 2006-2010 American Community Survey

Print Date: 09-27-2015
Recommendations

If You Decide To Do This..

• Have clarify around your goals
  o Course
  o Learning objectives
  o Partnership objectives
  o Other (scholarly objectives?)

• Be thoughtful upfront
  o Great opportunities
  o Extensive planning required
Acknowledgments

- Bonnie Bachman
- Caprice Moore
- Greg Gelles
- Joan Schuman
- Susan Renoe
- Greg Tucker
- Steve Devlin
- VentureWell
ECON/EMSE 3001 Efforts

- Data collection (IP)
  - MO DED/MERIC, DoL, DHSS, US Census, others

- Resource identification (IP)
  - Center for Rural Entrepreneurship, USDA, USEPA

- Team building (IP)
  - Faculty, administration, students
  - Bachman, Moore, Koharik, Young, Fischer

- Course proposal (IP)

- OURE proposals submitted
  - Using Entrepreneurship Case Studies to Advance Student Innovations in Rural Missouri
  - Connecting the University to Local Community Needs

- VentureWell E-Team Proposal (IP)
  - Build STEM and college attendance interests in rural MO
Partnering Opportunities within UM System

- **Course sharing**
  - Looking for partners on sister campuses
  - Funding available from UM System

- **Growing student pool**
  - Less than 10% of S&T students (551/6,258 UG) from rural MO

- **Seeking funding to support synergistic initiatives**
  - Non-profits
  - Federal
  - State
  - MDHE
  - Partnering with local chambers and EDC

- **Communication and understanding of efforts within UM System**
Practice and Policy

Practice

- Some awards
- Present

Policy: CRR 320.025 Promotion and Tenure

The role of teaching

- activities that require professional knowledge and that directly contribute to the academic advancement of students
- make more innovative contributions in courses, sometimes whole curricula