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Lessons Learned in an Internship Program to Recruit Pre-service Teachers

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The Columbus Region Academy of Future Teachers of STEM (CRAFT-STEM) utilizes an internship program for university freshmen and sophomores and a STEM camp for pre-college students to encourage the interns to consider careers in teaching. Interns assist with camp activities and other projects, supported by funding from the National Science Foundation's Robert Noyce Teacher Scholarship Program (award #1136356). As part of an ongoing research project, we examine four years' worth of data to identify strengths and weaknesses of the experience, and propose adaptations based on these findings.

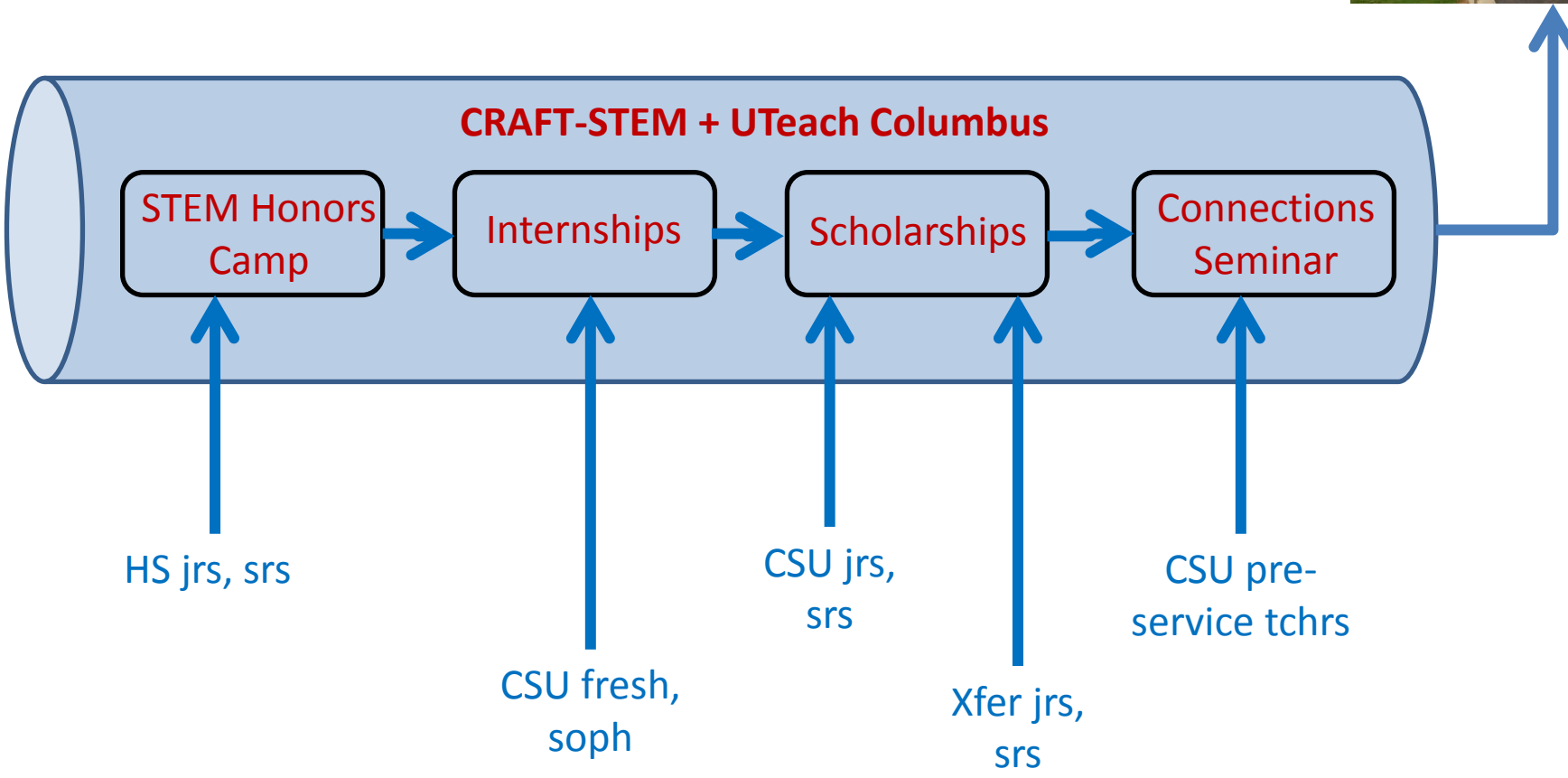
Underlying Questions

- How do we define “success” in an internship program designed to recruit pre-service teachers?
- Which kinds of activities are more/less successful?

Outline

- CRAFT-STEM program overview
- Format of STEM Honors Camp 2012-2015
- Literature review
- Assessing internships
- New design

CRAFT-STEM Pipeline



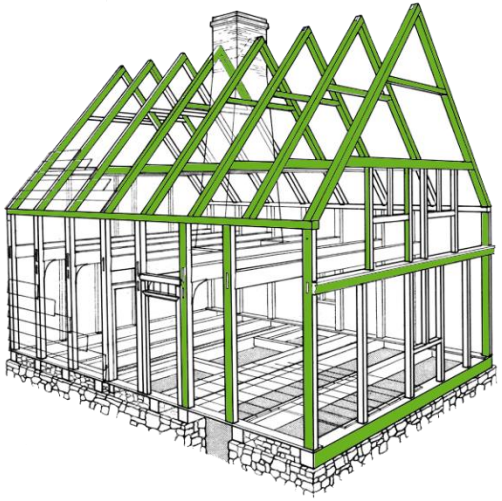
Internship Structure

- 400 hours
- Usually a combination of projects
- 2012-2015: All interns supported STEM Honors Camp
- 2016 on: More variety and flexibility, 200-400 hours

Challenges

- Recruiting enough interns
- Producing enough meaningful experiences
- Intern authority
- Intern involvement with activity design & planning

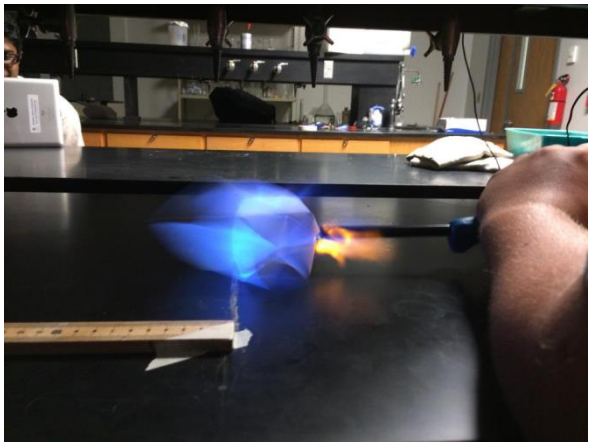
Structure of the Camp 2012-2015



- Small group research projects
- Hands-on workshops
- Career talks
- Industry field trips
- College 101 – thanks, Univ of Utah & STEP Central!
- Programming at Coca Cola Space Science Center & Oxbow Meadows Environmental Learning Center
- Fun and games
- Living 2 weeks in CSU dorms

Sample Small Group Research Projects

- Analysis of stream flow conditions on Lindsey Creek
- Analyzing the chemistry of our everyday environment
- Analyzing the water quality at Wren Pond
- Between the folds
- Develop and evaluate your Scratch game
- Analyzing images and videos by enhancing underlying mathematical features using user-friendly digital technology
- Investigating factors that affect the rates of enzymatic and osmotic reactions



Sample Hands-on Workshops

- Analyzing images and videos using digital technology
- Assessing water quality using chemical parameters & macro-invertebrate populations
- Creating animated characters & interactive stories using Scratch
- Exploring the chemistry of our everyday environment
- Measurement & analysis of water quality data
- Measuring stream flow conditions on Lindsey Creek
- Origami & the connections to STEM

Factors that impact the choice to pursue a degree in STEM leading to teacher certification

- Wants to work with children
- Wants to share understanding and/or enjoyment of STEM
  - Intrinsic interest in STEM itself
- Altruism

Less likely to persist in a STEM teacher preparation program if:

- Wants to improve quality of instruction
- Wants to live in a given geographic region
- Prioritizes a flexible career

Factors that discourage decisions to pursue STEM education certification

Perception of:

- Poor salaries
- Nature of the daily work of teachers
- Lack of job security
- Lack of job availability
- Perception of teaching as low prestige
- Discouragement by family and friends

Effects of financial incentives

- Can aid students to make decision to teach if the decision is reached later in their college career
  - Aids in problems related to rigidly scheduled degree plans
- Not necessarily as committed to teaching as a long term career

Should students be recruited early?

- Luft et al report it may be better to recruit certain students early in their academic careers.
  - Emphasis on student's commitment to education, prior experiences
  - Juniors and seniors have less time to change beliefs about effective educational practice.
- Rigid degree plans make it challenging for students to finish STEM course work and teacher certification requirements in 4 years, even with streamlined degree programs. Starting in the junior or senior year makes advising in order to graduate in 4 years even more challenging.
- Luft also found that juniors and seniors were more willing to commit to a career in education than less experienced students.

Mechanisms used to recruit STEM teacher candidates

- Recruitment class
  - Tuition waiver for that class
- Field experiences
- Advertising
- Scholarships
- Internships
  - Tutoring
  - Peer instruction
  - STEM camp
  - Informal education

Research to date unclear on effectiveness of paid internships as recruitment strategy

- Worsham at all found informal science setting internships ineffective in the short term at recruiting
- Paid internships attract many applicants who have motives other than exploring teaching as a career
- Inflexibility of degree plans, concerns about the career often concerns even after internship

- Luft et al finds that juniors and seniors are more likely to commit to a teaching career.
  - But inflexibility of degree plans can act as a detriment for this group
- Luft concludes it is better to recruit students earlier, particularly those with prior educational experience and interest for deliberate recruiting.

- Schuster reports that internships increase the interest in becoming a STEM teacher for the majority of participants.
- Schuster also reports that an early decision to become a STEM teacher dramatically shortens length of the program of study.

Other findings from the literature

- Many internship programs (paid or for credit) also require a seminar course designed to provide either training in educational research findings, or in awareness of STEM teacher preparation requirements

Assessing Internships

- 30 internships awarded: 6 in 2012, 7 in 2013, 9 in 2014, 8 in 2015
- 10/30 interns took UTeach coursework
- 3/30 interns (10%) became Noyce scholars
- 2 camp participants awarded internships

Post-internship survey (2013-2015)

Interest in teaching before

Already planning to teach	5
Contemplating teaching career as a possibility	6
I hadn't really given it any consideration	5
Somewhat disinterested	3
Definitely did not want to teach	3

Interest in teaching after

Much more interested	3
Somewhat more interested	15
No change	3
Somewhat less interested	1
Much less interested	0

Intern Survey Assessing Impact of Various Assignments on Enthusiasm for Teaching

Assignments include:

After-hours STEM Honors Camp activities
Developing Instructional Resources
Discussions with outside speakers in intern seminar
Exhibits outreach centers
“Large group” camp activities (hands-on workshops for 24)
Other summer camps
Peer Instruction Leader
Research with faculty mentor
Small research group projects
Tutor for math/science

Intern Survey: % Encouraged by Experience Type

Small research group projects (95%)
- 10 very encouraging
- 11 somewhat encouraging
- 1 neutral

Other summer camps (94%)
- 7 very encouraging
- 9 somewhat encouraging
- 1 neutral

Developing Instructional Resources (88%)
- 2 very encouraging
- 13 somewhat encouraging
- 2 neutral

Discussions with outside speakers in intern seminar (2014, 2015) (79%)
- 6 very encouraging
- 5 somewhat encouraging
- 3 neutral

Working as a Peer Instruction Leader (78%)
- 4 very encouraging
- 3 somewhat encouraging
- 2 neutral

Working as a tutor (75%)
- 6 very encouraging
- 3 somewhat encouraging
- 2 neutral
- 1 very discouraging

Intern Survey: % Encouraged by Experience Type

Exhibits outreach ctrs (69%)

- 6 very encouraging
- 3 somewhat encouraging
- 2 neutral
- 1 somewhat discouraging
- 1 very discouraging

After-hours camp activities (62%)

- 6 very encouraging
- 7 somewhat encouraging
- 7 neutral
- 1 somewhat discouraging

Large group camp activities (59%)

- 4 very encouraging
- 9 somewhat encouraging
- 7 neutral
- 2 somewhat discouraging

Research with faculty mentor (56%)

- 4 very encouraging
- 5 somewhat encouraging
- 4 neutral
- 2 somewhat discouraging
- 1 very discouraging

Schuster Survey Questions (2014, 2015)

The money was the primary reason
- 3 Strongly agree
- 8 Agree
- 4 Disagree
- 1 Strongly Disagree

Aware of cert req
- 5 Strongly agree
- 8 Agree
- 2 Disagree
- 1 Strongly Disagree

Family concern about becoming a teacher
- 2 Strongly agree
- 1 Agree
- 4 Neither agree nor disagree
- 5 Disagree
- 4 Strongly Disagree

Intern concern about becoming a teacher
- 1 Strongly agree
- 5 Agree
- 1 Neither agree nor disagree
- 8 Disagree
- 1 Strongly Disagree

Placements allowed exploration of teaching interests
- 3 Strongly agree
- 8 Agree
- 2 Neither agree nor disagree
- 2 Disagree
- 0 Strongly disagree

What I learned has informed college/career plans
- 3 Strongly agree
- 10 Agree
- 1 Neither agree nor disagree
- 2 Disagree
- 0 Strongly Disagree

Where are we going from here?

Camp

- Targeting grades 6-8
- Eliminating dorm stay
- Fewer career talks (no lectures)
- No small research groups
- No College 101

Internships

- Great role in designing and planning camp activities
- More responsibility for leading camp activities
- Allowing fewer total hours to accommodate more scheduling constraints

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Questions?

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