PULSE

Northwest Regional Network

Enabling Change Agents with Systems Thinking Tools

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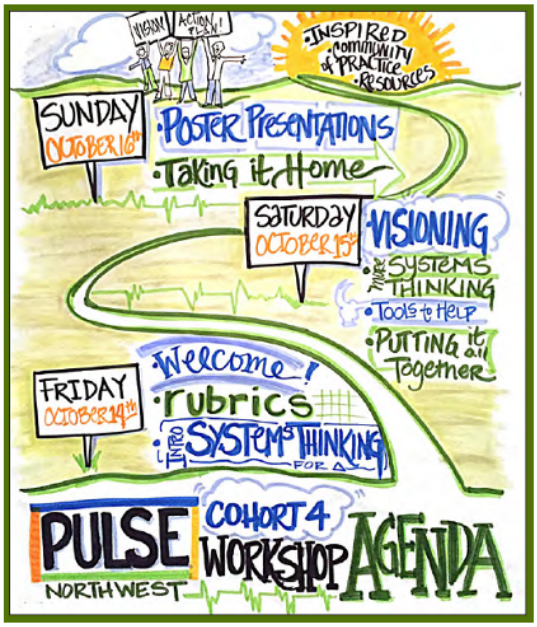
NSF EAGER # 1347553
NSF RCN-UBE # 1346583

PULSE

Northwest Regional Network

- 3-day workshops held at peaceful and secluded Talaris Conference Center in Seattle
- 12-15 teams of 3-5 department members, including a chair or higher administrator
- Serving Pacific NW (AK, ID, MT, OR, WA, WY)
- Representatives of all institution types: community colleges, PUIs, regional comprehensive and R1; over 60 of about 140 institutions in the region participated

Our Focus is on Department-Level Change



Overview
Teams of 3-5 faculty & administrators attend a 3 day systems-thinking workshop in the fall
Create an action plan
Return to institution and enact their plan, with help of their coach.
In May, return to NW BIO and present a poster to report out on their work.

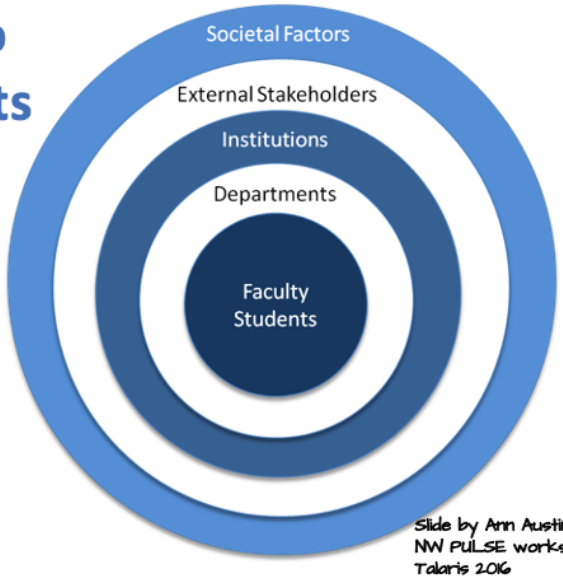
. 2019 May 30;14(5)

PULSE Vision & Change Rubrics

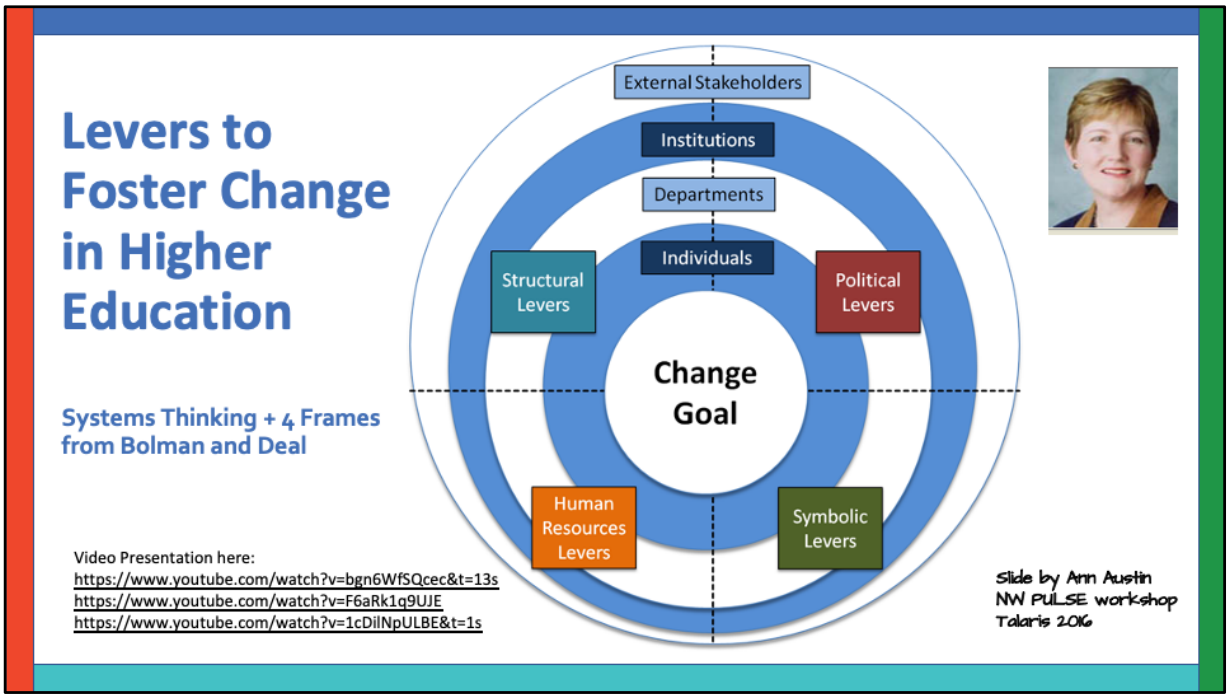
- **Snapshot rubric with 17 criteria to quickly ID strengths & weaknesses**
- **Provides benchmarks**

	Criteria	0 (Baseline)	1 (Beginning)	2 (Developing)	3 (Accomplished)	4 (Exemplar)
C. COURSE LEVEL ASSESSMENT ***(go to instructions)***						
4	**Linkage of summative assessments to learning outcomes**	Summative assessments are not linked to learning outcomes	Some courses have summative assessments that measure learning outcome achievement	Many courses have summative assessments that measure learning outcome achievement	The majority of courses have summative assessments that measure learning outcome achievement	The majority of courses have summative assessments that measure learning outcome achievement as part of a coherent, evidence-based assessment plan
5	**Evaluation of time devoted to student-centered activities in courses**	Time spent in student-centered activities is not measured	Time spent in student-centered activities is informally estimated at the end of term	Time spent in student-centered activities is documented by approximation after the fact in formal course evaluation at the end of term	Time spent in student-centered activities is informally tracked throughout the term and reported in formal course evaluations at the end of term	Time spent in student-centered activities is formally documented at points throughout the term and reported in formal course evaluations at the end of term

A Systems Approach to Understanding Contexts Relevant to Change in Higher Education



Slide by Ann Austin
NW PULSE workshop
Talaris 2016



Structural: Tenure & Promotion Policies
Reward systems
Organization of Work
Appointments to address change goals
Accountability processes

Recruitment Processes
Professional Development (for faculty or leaders)
Mentoring/networking
Individual consultations or grants

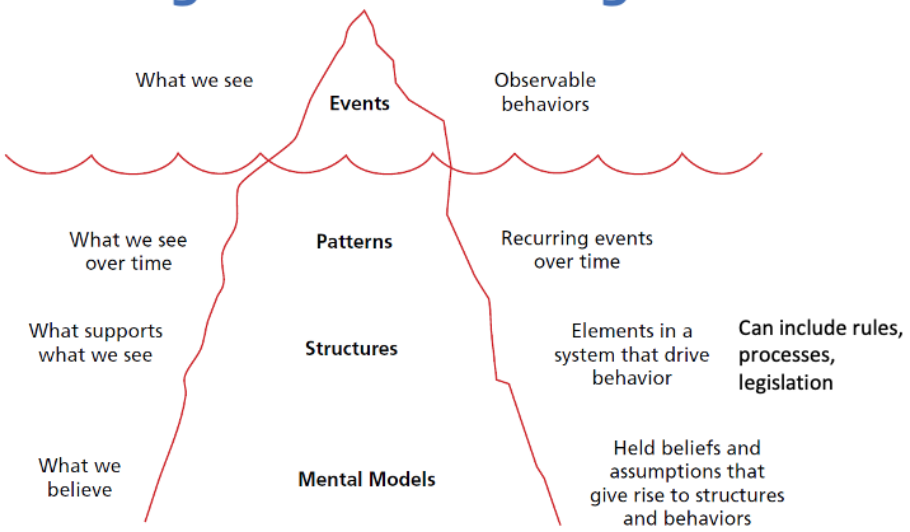
Human Resources
Recruitment Processes
Professional Development (for faculty or leaders)
Mentoring/networking
Individual consultations or grants

Political: Leadership practices
Governance processes

Appointment of committees, task forces, and commissions
Data gathering and analysis (e.g., use of baseline data, publicizing and discussing data, accountability processes)

Symbolic: Opportunities for sense-making
Structured conversations
Publicity and communication
Awards and celebrations
Events

Systems Thinking Tool: The Iceberg Model



Habits of a Systems Thinker

Seeks to understand the big picture

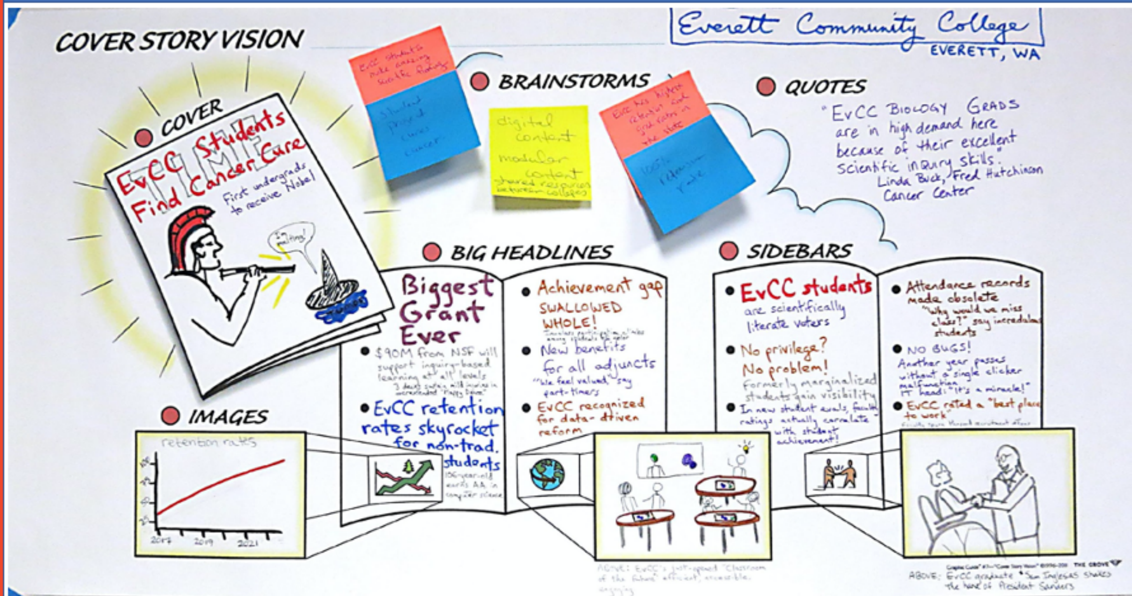
Recognizes that a system's structure generates its behavior

Changes perspectives to increase understanding

Considers short-term, long-term and unintended consequences of actions

Uses understanding of system structure to identify possible leverage actions

www.watersfoundation.org

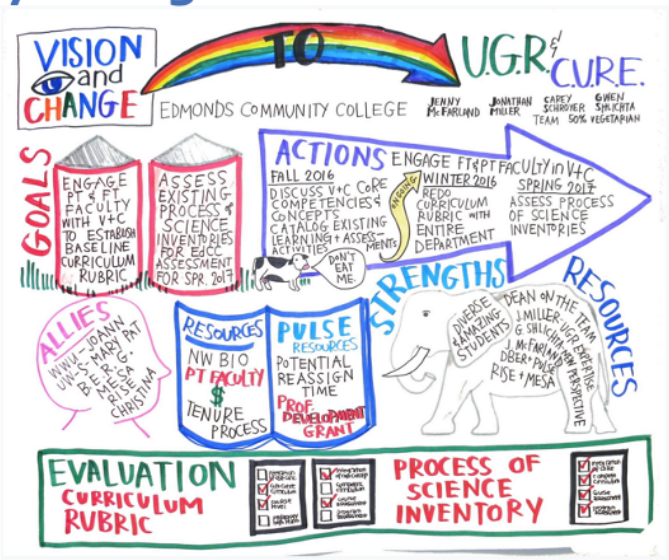

COVER STORY VISION
Everett Community College
EVERETT, WA
COVER
EvCC Students Find Cancer Cure
First undergrads to receive Nobel
BRAINSTORMS
digital content
modular content
shared resources between colleges
QUOTES
"EvCC BIOLOGY GRADS are in high demand here because of their excellent scientific inquiry skills."
Linda Buck, Fred Hutchinson Cancer Center
BIG HEADLINES
Biggest Grant Ever
$90M from NSF will support inquiry-based learning at all levels
EvCC retention rates skyrocket for non-trad. students
Achievement gap SWALLOWED WHOLE!
New benefits for all adjuncts
"We feel valued," say part-timers
EvCC recognized for data-driven reform
SIDEBARS
EvCC students are scientifically literate voters
No privilege? No problem!
Formerly marginalized students gain visibility
In new student evals, faculty ratings actually correlate with student achievement!
Attendance records made obsolete
"Why would we miss class?" say incredulous students
NO BUGS!
Another year passes without a single clicker malfunction
IT head: "It's a miracle!"
EvCC rated a "best place to work"
IMAGES
retention rates
2017
2019
2021
ABOVE: EvCC graduate shakes the hand of President Sanders

Edmonds Community College

Action Plan

Shared Vision

BUILDING A COMMUNITY THAT SUPPORTS UNDERGRAD. RESEARCH FOR ALL!



Edmonds Community College

NW Bio Report (7 months after workshop)

Elements of Systems Thinking

Partnership for Undergraduate Life Sciences Education

Engaged Learning thru Undergraduate Research & Service Learning

Edmonds Community College
Gwen Shlichta, Jenny McFarland, Jonathan Miller

VISION – *Students understand & practice authentic scientific research in courses (CURE) & projects.*

MAIN GOAL – *Increase student participation & engagement in research. Goal 2: Focus on & assess 2 core competencies in all BIOL & NUTR courses. Goal 3: All BIOL & NUTR faculty complete PULSE curriculum rubric.*

ACTIONS

- All faculty were provided copies of the **2 V&C reports**
- FT & adjunct faculty discussed teaching & assessment V&C **core competencies** & curriculum rubric
- Many faculty completed **PULSE curriculum rubrics**, at the course level, for most BIOL & NUTR courses
- **Undergraduate Research**: deepened Course-based Undergraduate Research Experiences (CUREs) in BIOL& 212, 213, 260 & 241 & increased #s in UGR courses, BIOL 293 & 255 (28 students in 2016-17)
- **Service Learning** (SL): FT faculty (Jenny & Gwen) attended day-long workshop & implemented SL in courses: 212, 213 & 241; more planned for next year.
- **Systems Thinking**: Considered "Big Picture" & "Leverage" at department level
- **Blogs** increased visibility of SL & CURE

UNINTENDED CONSEQUENCES?

+ Blogs increased engagement & sharing & can be used to assess impact on students
+ Increased lab time for CURE in BIOL& 212 & 213 & 241
- Increased faculty workload & tension

BARRIERS & CHALLENGES

- **Authentic Research** Challenge: Students struggle to generate meaningful and testable research questions. *How can we better help intellectually passive students & student groups?*
- Identification & effective **utilization of resources** outside EdCC takes time & motivation.
- Faculty **Communication & Collaboration**: How can we better incentivize faculty communication & collaboration given time & other constraints?

RESOURCES & ALLIES

- *Vision and Change* reports & PULSE rubrics
- EdCC resources:
  - *Christina Hanson*, biology lab staff
  - *Nate Goodman, STEM program coordinator*
  - *Thomas Murphy* faculty in LEAF school
  - *Robin Datta*, faculty coordinator for UGR
  - Center for Service Learning
- NASA grant (J. Miller) & Eagle Harbor Technologies partnership
- Travel $ for students (CCRUI & RiSE NSF grants)

STRENGTHS & LEVERAGE

- Talented and passionate adjunct and FT faculty and staff with broad experience in research and diverse experiences in science in society.
- Departmental goals (CLOs) and assessments
- Levers: Center Service Learning, EdCC UGR initiative, and national CCURI connections

PRODUCTS

- PULSE curriculum rubrics for Biology & Nutrition courses.
- Increased participation of students & faculty in service learning – connecting science & society (visible in blog posts)
- Increased 200-level participation in URG
- Students presented URG in Spring 2017: EdCC student showcase, annual UW UGR Symposium, & 3 students presented at national CCURI conference

SUSTAINABILITY

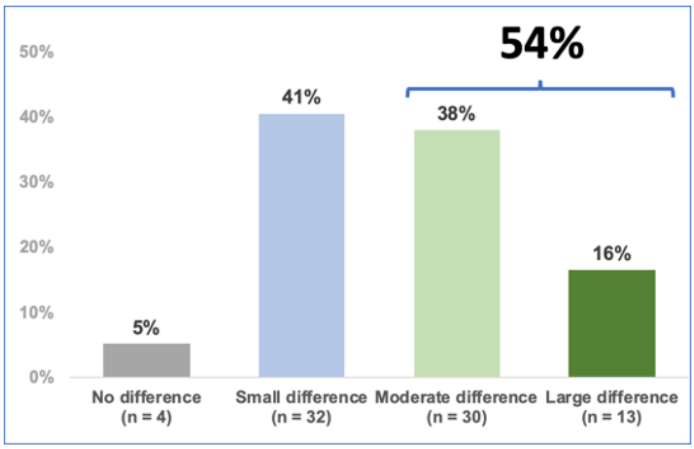
- NWBio 2018: share data on two V&C core competencies: Process of Science & Science & Society, across our life science courses.
- Continue collaboration & conversations among faculty we can make assessing these core competencies part of our department culture.

FUTURE GOALS

- Spring quarter 2017 we will have data from students in most BIOL & NUTR courses from *Science Knowledge Survey*. Analyze data & report in 2018
- Qualitative analysis of presentations & blog posts to assess impact of CURE & SL on understanding of Process of Science and Science & Society
- Have CURE and SL as assessed components of all BIOL & NUTR courses at EdCC
- Increase student enrollment in & frequency of UGR course opportunities

Did Engagement with NW PULSE create change?

YES!



EDC Learning transforms lives.

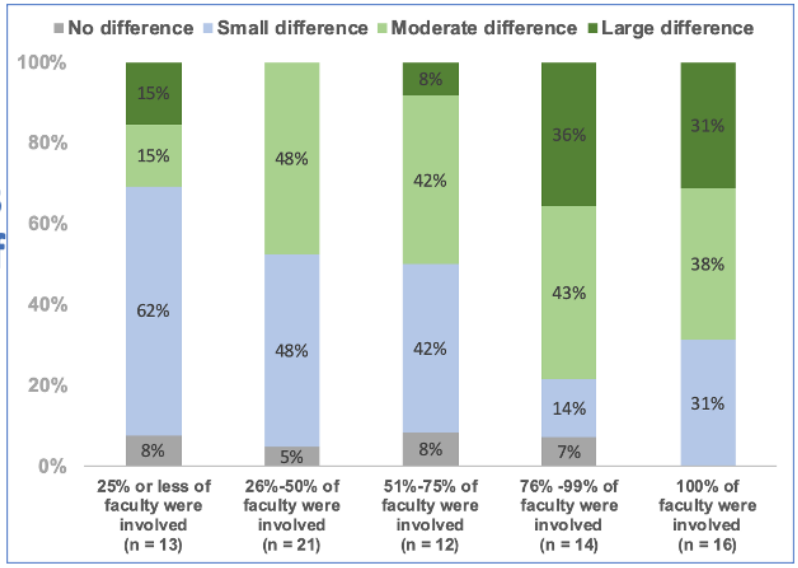
Overall Achievement of Goals

Rating	Number of Schools	Percentage of All Schools (n = 44)	Percentage of Schools Coded (n=32)
Met a few of their goals	1	2%	3%
Met some of their goals	13	30%	41%
Met most/all of their goals	18	41%	56%
Insufficient information	12	27%	-

56% of schools providing sufficient information met most/all of their goals
27% of schools did not provide enough information to determine whether or not they met their goals

EDC Learning transforms lives.

Most impact achieved in departments with >75% of faculty involved

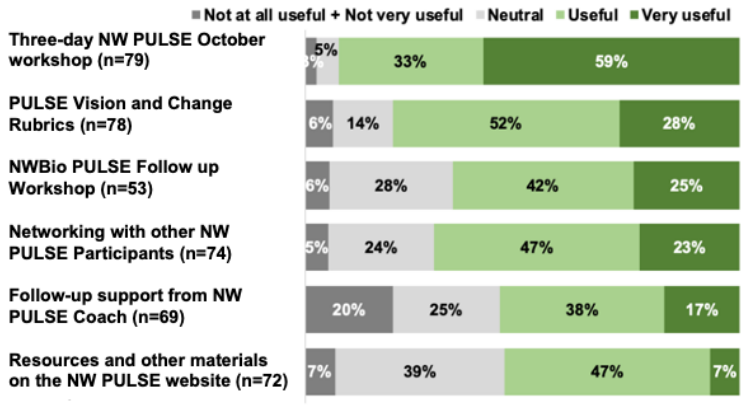


EDC Learning transforms lives.

Most important component was the Fall workshop!

Beneficial workshop features noted by participants:

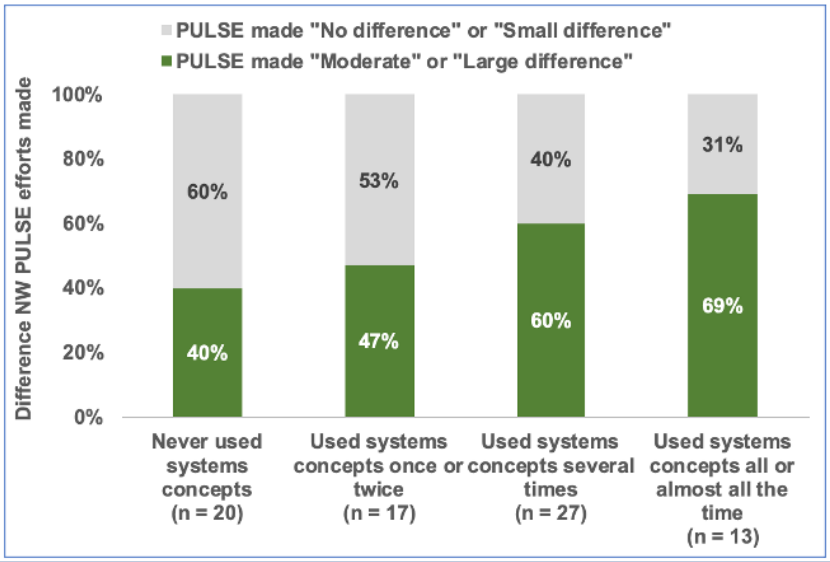
1. *A retreat to work with colleagues*
2. *Information and resources shared including V&C rubrics and systems thinking*
3. *Networking/meeting others and sharing experiences*
4. *Assistance and guidance of the fellows*



EDC Learning transforms lives.

Did the use of Systems Thinking contribute to departmental change?

YES!



EDC Learning transforms lives.

What actions did institutions take?

Institution Type	Most Common Actions and # (%) of Schools Within Institution Type
Community College *n=18*	Design new curriculum; 9 (50%) Mapping courses to V&C; 9 (50%)
Liberal Arts *n=8*	Assess current courses; 5 (63%) Mapping courses to V&C; 4 (50%) New student goals; 4 (50%)
R1 *n=7*	Assess current courses; 6 (86%) Mapping courses to V&C; 5 (71%) Seek faculty input; 5 (71%)
Regional Comprehensive *n=7*	Mapping courses to V&C; 6 (86%) Assess current courses; 4 (57%)

EDC Learning transforms lives.

Source: NWBIO Posters; n = 40-41 with outcome data
Categories reported by at least two schools

What Barriers did Teams Encounter?

Time & Resistance

Challenge	Strategies to address challenge
PULSE team's limited time to engage faculty	→ Obtain administrative support and/or funding for release time
Limited time of other faculty to become involved	→ Rely on PULSE team members to do majority of work → Foster peer learning community of interested faculty → Hold faculty retreat → Integrate as part of faculty meetings
Resistant faculty	→ Persuade with evidence (student data) → Wait for them to retire, hire more flexible faculty → Give up (work around them)

EDC Learning transforms lives.

Success Strategies

Engage people systematically

- Build a critical mass of faculty, including adjuncts, tenured & tenure-track
- Engage with faculty who are “influencers” & decision-makers
- Acquire support from administrators

Participate in a community of practice

- Use systems thinking and foster its use by others
- Connect their institution to additional existing resources
- Have patience (change takes time)

PULSE

Northwest Regional Network

Past & present members of NW PULSE + Collaborators

NW PULSE

- Gita Bangera, Bellevue College
- Alyce DeMarais, Univ. of Puget Sound
- Christine Goedhart, Univ. of British Columbia
- Jenny McFarland, Edmonds Community College
- Joann Otto, Western Washington Univ.
- Erika Offerdahl, Washington State University
- Gary Reiness, Lewis & Clark College

Steering Committee

- Mary Pat Wenderoth, Univ. of Washington
- Carol Pollock, Univ. of British Columbia
- Stas Stavrianeas, Willamette Univ.

Systems Thinking Consultants

- Nalani Linder
- Steve Byers

Graphic Recorder

- Claire Bronson

Assessment Consultants

- Ginger Fitzhugh, EDC
- Carrie Liston, EDC

Resources referred to in this Presentation

Pre-workshop materials:

Ann Austin White Paper on Promoting Evidence-Based change in undergraduate STEM education

Peter Senge Video on Systems Thinking

Ann Austin's 2016 PULSE NW presentation in 3 parts:

https://www.youtube.com/watch?v=bgn6WfSQcec&t=13s
https://www.youtube.com/watch?v=F6aRk1q9UJE
https://www.youtube.com/watch?v=1cDilNpULBE&t=1s

PULSE Rubrics

Grove Tools Cover Story Vision Template .

Waters Center for Systems Thinking: Habits of a Systems Thinker.

Bolman and Deal's Four Frames applied to STEM departments.