



Education and Training Action Initiative

Base Support Action Initiative (1 of 4)

Cluster Work Group:	Education & Training
Prepared by:	Theresa Britschgi & Jeffrey W. Raker
Date:	03/16/05

Title or Name of the Initiative: <i>Develop a name for the effort that communicates action and positive outcomes. This initiative will be known as:</i>
Support the Existing Base

Initiative Champion/Implementation Team Members: <i>Name and contact information for each person working on this initiative.</i>	
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Description & Motivation: <i>What is the nature of the cluster challenge the initiative will address?</i>
A number of useful, vital & unique science education outreach programs currently exist, providing critical retraining/upgrading opportunities for K-12 teachers as well as engaging experience for their students. Additionally, a handful of current high schools have already dedicated curriculum and programs with biotech foci (e.g., Ballard HS, Juanita HS & Mariner HS). Both the external outreach resources and the internalized programs are in need of fiscal and stakeholder support (e.g., from industry partners, potential funders and their districts).

Objective: <i>What is the objective of the initiative? How will it impact economic or cluster development in the region? Describe how it relates to the Prosperity Partnership's goal of job creation?</i>
This Action Initiative seeks to increase sophistication of local educators in the life sciences tactics/principles as well as career opportunities in the growing industry. Increasing awareness of, and appreciation for successful internal and external programs will increase teacher participation, and the sustainability of the outreach resources. Helping teachers upgrade knowledge & skills (including time off for workshops and other activities) in an ongoing process would further refine the programs and tailor them to the needs of the cluster.
Provide opportunities for industry leaders and science educators running outreach

Objective: *What is the objective of the initiative? How will it impact economic or cluster development in the region? Describe how it relates to the Prosperity Partnership's goal of job creation?*

programs to discuss topics and skill sets related to industry to be included in educational programs. Industry leaders should be made aware of the successes of existing programs, and overall recognition for innovative existing programs.

Obstacles and Impediments Likely to Affect Implementation: *What do you expect to be the most significant obstacles to implementation? How can/will they be overcome? What resources will be required (e.g., political support, lobbying efforts)*

1. **Strategy**-We need a vision and an advisory team of teachers, outreach partners and industry to help define what is the unifying needs of the region-and how professional development enhancement schemes can uniformly help the industry thrive in 2010, as well as support teachers in their career paths and responsibilities.
2. **Time**-Teachers need dedicated time to attend outreach programs, or to engage in industry-placed job shadows, to upgrade LS skills.
3. **Money**-Districts need supporting funds to subsidize the cost of substitutes when teachers attend workshops. Additional funds are needed to continue to support internship coordinators in high schools that provide critical facilitation support for these positions as well as general career guidance. Science teachers are unable to provide this assistance in addition to their teaching responsibilities.
4. **Money**-existing, successful outreach programs and existing programs need partnerships with industry and funding partners, to increase sustainability and program size.
5. **Marketing**-Teachers are currently swamped with priorities and responsibilities. Dynamic marketing is needed to motivate them to make time for professional development workshops & job share opportunities. Thought should be given to an established certification teachers can achieve (inclusive of salary & seniority benefits) through participation in these programs.

Funding: *What is the estimated cost of this initiative, in phases beginning with design, the "ramping up" phase, and then for ongoing annual costs? Note alternative sources of funding for each phase.*

Crafting of the overall strategy, assessment of the current available programs, and early marketing of programs in year one could cost roughly \$20,000.

Augmenting and supporting existing programs to meet the 2010 needs might cost in the area of \$300K annually.

Outcome/Results: *How will know that we have achieved our objective? How will we evaluate whether or not we have been successful?*

Assessment tools will be crafted to determine how many students/teacher are considering continuing education in the life sciences in college-see this in WA state learning institutes, as well as follow up interviews. Additionally, industry surveys could be crafted to inform us to how many Washingtonians are getting hired by local firms.

Action Steps: <i>Describe the initiative in specific steps: Tasks (What, Who, When).</i>
1. Identify successful outreach partners (e.g., NWABR, UW, FHCRC, & SBRI)-outlining each program's unique vision, audience and annual expenses.
2. Compose advisory group of teachers, outreach partners and business leaders to draft an umbrella strategy for sustainable success and reform (as demonstrated in overall upgrade of teacher skills).
3. Market benefits of programs to industry and districts. Asking each party to be a stakeholder in its future.
4. Draft investment strategy to augment funding and sustainability of local outreach programs.
5. Draft proposal for districts and OSPI to sponsor, outlining mechanisms by which teachers would be awarded for their participation in development workshops (e.g., credits, hours, certification).
6. Market benefits of programs to potential funders (e.g., encourage funding possibilities through grants & industry partnerships like WBBA, and encourage industry-drafted letters of support). Funding would be directed to increase spaces available for teachers in workshops, or # of workshops hosted/year, and for materials/curriculum teachers can take away with them.
7. Increase public awareness for these programs as well as the already spectacular schools with biotech programs (e.g., Juanita HS, Ballard, Mariner, others? How can we do this? Edit the annual report of available resources (e.g., the Bartell Drugstore school survey book, OSPI report card of schools) to magnify the valuable resources in schools with life sciences focus.
8. Provide funding for resource coordinator-be it for student internships, or to help place more science teachers into development programs and job shadows in industry.
9. Encourage other schools to start an academy, particularly in inner city and south end schools. We will need more schools speaking of these career opportunities, to be able to fill the open technical positions in 2010.
10. Encourage communication between industry leaders and science educators by organizing one or more meetings or symposia that bring together scientists from Seattle area biotechnology companies and science educators to discuss the biotechnology industry and biotechnology education.

Timeline: Provide a rough schedule of activity for each step above and the lead person for each task. (Example: Establish implementation team/Jones, Hold first planning meeting/Johnson, Prepare concept/funding proposal/Smith, dates).

<i>Step</i>	<i>Key Person</i>	<i>Timeline</i>
1. Identify survey resource. Publish manual of available regional resources.	(e.g., Britschgi, Chowning, Cude, Munn, Wignall, Ehrman)	Outreach Summit 6/17/2005 (Summer 2005)
2. Compose advisory group	Local outreach members, industry & "biotech teachers"	Summer 2005
3. Market benefits to districts and districts	Advisory group, Elaine Woo, Eric Wuerston	6/05-12/5
4. Budget		Fall 2005
5. Certification plan	Advisory group, Elaine Woo, Eric Wuerston, WDC	Fall 2005
6. Funding		Winter 2006
7. Marketing to public		Spring 2006
9. Increase #s of "biotech academies" in region	SPS, Shep Siegel, Amy Leslie, Danielle Thompson, others?	2006-07
10. Increase communication between industry leaders and science educators	WBBA members, UW faculty, local outreach members	7. Increase communication between industry leaders and science educators
Other action steps/implementation timing issues:		



Curriculum Development Action Initiative (2 of 4)

<i>Cluster Work Group:</i>	<i>Education & Training</i>
<i>Prepared by:</i>	<i>Maureen Munn, Patricia Dombrowski & Jeffrey W. Raker</i>
<i>Date:</i>	<i>03/11/05</i>

Title or Name of the Initiative: <i>Develop a name for the effort that communicates action and positive outcomes. This initiative will be known as:</i>
Life Sciences Curriculum Development

Initiative Champion/Implementation Team Members: <i>Name and contact information for each person working on this initiative.</i>	
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Description & Motivation: <i>What is the nature of the cluster challenge the initiative will address?</i>
Regional prosperity in the life sciences must be nurtured by learning opportunities. It is rationale to promote, craft and deploy curriculum that will engage future scientists and others to the biotechnology workforce.

Objective: <i>What is the objective of the initiative? How will it impact economic or cluster development in the region? Describe how it relates to the Prosperity Partnership's goal of job creation?</i>
Currently, the Washington State Office of the Superintendent of Public Instruction (OSPI) does not have a bioscience curriculum available to school districts. While a unified k-12 effort is ideal, the object of this initiative is to support the development of a sustainable & regularly updated bioscience curriculum by OSPI for teachers of grades 9-12.
Assuming life sciences cluster growth, a workforce pipeline must be established to ensure adequate employers resources and continuity within the sector.

Obstacles and Impediments Likely to Affect Implementation: *What do you expect to be the most significant obstacles to implementation? How can/will they be overcome? What resources will be required (e.g., political support, lobbying efforts)*

Different districts and even schools within a given district do not align to a single curriculum. Biotechnology courses are typically taught as advanced courses, by teachers that have crafted curricula from a variety of resources. Our aim must be to develop and deploy a standardized curriculum resource, following the framework of the OSPI, that fulfill the needs of teachers as well as the burgeoning life sciences industry.

Although OSPI is predisposed to development of biotechnology curriculum, the initiative needs a strategy, a leader and funding.

Funding: *What is the estimated cost of this initiative, in phases beginning with design, the “ramping up” phase, and then for ongoing annual costs? Note alternative sources of funding for each phase.*

Design: Curriculum development is estimated at \$250,000.

Ramp Up: \$250,000.

Annual Costs: Varies by district

The National Center for the Biotechnology Workforce, funded by the Department of Labor, may be a resource for encouraging DOL funding for this project, in collaboration with State of Washington appropriation. It will be discussed at the National Center for the Biotechnology Workforce meeting March 24 in Winston-Salem, North Carolina. If goals outlined in the “engage the industry” are met, then we may be able to incorporate funding, content and vision from Industry partners.

Outcome/Results: *How will know that we have achieved our objective? How will we evaluate whether or not we have been successful?*

Metrics on both ends of this initiative will tell the story:

- 1) How many high school students experienced this curriculum?
- 2) Teacher use the curriculum-in their current courses (or a part of a de novo biotech program)
- 3) Employers satisfaction with availability and caliber of workforce.

Action Steps: *Describe the initiative in specific steps: Tasks (What, Who, When).*

1. Use the existing framework at OSPI for a biotech curriculum to be implemented. Use

Action Steps: <i>Describe the initiative in specific steps: Tasks (What, Who, When).</i>
models from other similar advances and tailor them to local needs (e.g., N. Carolina Research Triangle Park).
2. Involve industry input into the curriculum development process.
3. Convene high school science teachers for early inclusion. Involve schools with recognized biotechnology programs (e.g., Ballard, Juanita & Shorewood).
4. Identify gaps in areas of need defined by industry and teachers and existing instructional materials-and augment these gaps.
5. Pilot curriculum
6. Train teachers

Timeline: <i>Provide a rough schedule of activity for each step above and the lead person for each task. (Example: Establish implementation team/Jones, Hold first planning meeting/Johnson, Prepare concept/funding proposal/Smith, dates).</i>		
<i>Step</i>	<i>Key Person</i>	<i>Timeline</i>
1. Obtain biotechnology framework from OSPI	Patricia Dombrowski, Eric Wuerston, Elaine Woo	May 05
2. Form E&T advisory group		Spring 05
3. Align needs of the E&T action initiatives, to develop strategy to motivate and incorporate industry leaders in E&T initiatives	WBBA, Amgen, Advisory Group	Summer 2005
4. Meet with Outreach partners and science teachers (with biotech focus), to assess current inventory of curricula	Advisory group, Glodowski, Stoops, Pagels, Kelly	Summer 2005
5. Present curriculum resources to industry-ask for feedback		
6. . Identify Gaps	Advisory group	Fall 2005
7. Develop curriculum		Winter 05
8. Train set of teachers with Pilot Curriculum		Summer 05
9. Disseminate broadly		Summer 06

Other action steps/implementation timing issues:

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Engage Industry Action Initiative (3 of 4)

Cluster Work Group:	<i>Education & Training</i>
Prepared by:	<i>Berta Lloyd & Jeffrey W. Raker</i>
Date:	<i>03/11/05</i>

Title or Name of the Initiative: <i>Develop a name for the effort that communicates action and positive outcomes. This initiative will be known as:</i>
Life Sciences Industry Supported Education & Training

Initiative Champion/Implementation Team Members: <i>Name and contact information for each person working on this initiative.</i>	
Theresa Britschgi (Champion)	theresa.britschgi@sbri.org
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Wayne Ottum (Co-Champion)	wayne@ottumenterprises.com

Description & Motivation: <i>What is the nature of the cluster challenge the initiative will address?</i>
Education and training facilities are working in relative isolation-and are likely to more effectively produce a suitable set of sufficiently trained professionals with the engagement of industry.

Objective: <i>What is the objective of the initiative? How will it impact economic or cluster development in the region? Describe how it relates to the Prosperity Partnership's goal of job creation?</i>
Address the mismatch between the skills that are needed in the LS industry and the education & training workers receive. Address the need for more targeted curriculum, ongoing interaction between educators and industry, and sharing of resources.

Obstacles and Impediments Likely to Affect Implementation: <i>What do you expect to be the most significant obstacles to implementation? How can/will they be overcome? What resources will be required (e.g., political support, lobbying efforts)</i>
Industry Buy In. Limited Financial Resources.
How can this be overcome? An importation initiative would be to create a Regional Biotechnology/Biomedical Skill Panel Partnership composed of industry, WBBA, high schools, community colleges, 4-year institutions, non-profits and the King County Workforce

Obstacles and Impediments Likely to Affect Implementation: *What do you expect to be the most significant obstacles to implementation? How can/will they be overcome? What resources will be required (e.g., political support, lobbying efforts)*

Development Council. This panel industry panel would identify employment gaps and identify the skills, knowledge and abilities necessary to be successful in the workplace. High Schools, community colleges and universities would embed this skill standard information into their curriculum. This process would need to be replicated every 3 to 5 years. Other important initiatives would be to create a Puget Sound Life Sciences Training Center, articulation across the curriculum for high schools, community colleges and four-year institutions, creation of a marketing plan, and identification of funding sources.

Funding: *What is the estimated cost of this initiative, in phases beginning with design, the “ramping up” phase, and then for ongoing annual costs? Note alternative sources of funding for each phase.*

See first initiative for estimated costs.

Outcome/Results: *How will we know that we have achieved our objective? How will we evaluate whether or not we have been successful?*

- Graduates from community colleges and 4 year institutions are being hired by the biotechnology/biomedical industry.
- Industry is hiring regionally and not looking outside the state or country to fill openings.
- Increased communication between industry and education
- School curriculum is embedded with industry skill standards
- Articulation agreements exist between high schools, community college and four-year institutions.

Action Steps: *Describe the initiative in specific steps: Tasks (What, Who, When).*

1. Encourage industry to hire locally prior to recruiting out of state. This would require a marketing strategy wherein industry sees the cost savings and how it increases the overall vitality of the region.

2. Encourage the LS industry to include educators & future scientists in all endeavors such as commercial-based research, clinical trials, and production (e.g., SEP, internships & job shadows)

3. A symposium with speakers that have bridged the gap from the academic world to the commercial world of LS. Incorporated as part of formal training in order to highlight the differences between the academics and commercial-oriented approach to research. This would aid in transitioning academicians into commercial-minded individuals with jobs in biotech (move future scientists from the post-doc world into the pipeline world more successfully by highlighting these issues in formal training).

Action Steps: Describe the initiative in specific steps: Tasks (What, Who, When).

4. Have industry involved in short courses or participate in general lecture series at local training centers.

5. Give industries the opportunity to celebrate their investment. Let industry portray their discoveries, advancements & products in a centralized, publicly-accessed location (e.g., BioQuest Gallery)-along side of images of their partnership in worker training & education.

6. Create a Biotechnology/Biomedical Industry Skill Panel to identify the skills, knowledge and abilities necessary to be successful in the workplace. Findings would be embedded into curriculum.

Timeline: Provide a rough schedule of activity for each step above and the lead person for each task. (Example: Establish implementation team/Jones, Hold first planning meeting/Johnson, Prepare concept/funding proposal/Smith, dates).

<i>Step</i>	<i>Key Person</i>	<i>Timeline</i>
1. Planning meeting to select findings/initiatives, action plan, funding sources and timeline. (Sub groups would be developed to take leadership on initiatives. See below).	All members	May 2005
2. Puget Sound Life Sciences Center-(Education links: high schools, community colleges, four-year institutions)		June to August 2005
3. Regional Biotech Skill Panel for career pathway & skill identification.		June to August 2005
4 Marketing Plan/Symposiums, etc.		June to August 2005
5.		
6.		
7.		

Other action steps/implementation timing issues:

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Life Sciences Training Center (4 of 4)

Cluster Work Group:	Life Sciences
Prepared by:	Sandy Clark & Jeffrey W. Raker
Date:	March 9 th , 2005

Title or Name of the Initiative: *Develop a name for the effort that communicates action and positive outcomes. This initiative will be known as:*

The Puget Sound Life Sciences Training Center

Initiative Champion/Implementation Team Members: *Name and contact information for each person working on this initiative.*

Sandy Clark (Seattle King County WDC)
Theresa Britschgi (SBRI)

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Description & Motivation: *What is the nature of the cluster challenge the initiative will address?*

The Puget Sound Life Sciences Training Center will encompass learning and training opportunities for all levels of employment—from high school students to PhDs. The center will link and support programs such as BioQuest that expose youth to career opportunities in the life sciences and provides them with hands-on learning experiences to support their classroom learning. The training center will also provide incumbent workers, including laboratory technicians, with skill upgrade training to help companies utilize new technologies and move from R&D activities to production and manufacturing of bioproducts. The training center will also serve as a one-stop shop for life sciences companies seeking customized training services. The training center, located in the heart of the life sciences community in Seattle, will provide a unique opportunity for young workers, retrained workers, and incumbent workers to learn side-by-side with industry leaders and world renowned scientists.

Furthermore, unlike other biotechnology training models in the United States, the Puget Sound Life Sciences Training Center will include the "life sciences" series of workshops, training, lectures, and courses related to nanotechnology, bioinformatics, biomanufacturing, biotechnology research and development, biomedical devices, and specific science and computational data courses.

In addition to training, this center may provide incubator lab space for emerging companies where students work along side start-ups. The center may also provide a strong link to current entrepreneurial efforts such as Accelerator Corp.

The Life Science Training Center partners recognize the importance of developing this sector of our economy through workforce development. The center will be not only unique due to its powerful partnership, but also critical to the region's dynamic life sciences industry by boosting our global competitive advantage. Support for the Life Sciences Training Center will provide the

Description & Motivation: *What is the nature of the cluster challenge the initiative will address?*

skilled workforce that our region and state must have in order to foster a healthy life science industry, which in turn could be a major boon to our economy.

Objective: *What is the objective of the initiative? How will it impact economic or cluster development in the region? Describe how it relates to the Prosperity Partnership's goal of job creation?*

Adults beginning their careers in the life sciences will find clear career paths and skill training. For incumbent workers, continued learning and skill development in the areas of laboratory techniques and methods, bio-manufacturing, and FDA regulation is critical; customized training for these workers will ensure that employers maintain a robust workforce and that employees develop the skills they need in order to remain competitive within the industry. For K-12, strong support for existing and future programs. Finally, this center response directly towards ensuring current Puget Sound residents benefit from job creation.

Obstacles and Impediments Likely to Affect Implementation: *What do you expect to be the most significant obstacles to implementation? How can/will they be overcome? What resources will be required (e.g., political support, lobbying efforts)*

Industry Support: There needs to be strong industry support for a Life Sciences center. If industry does not see a need, then training programs will fail to thrive and sustainability will be in question. If such a center is embraced, then funding will likely follow.

Collaboration of Educational Institutions: A second obstacle, the merging of community colleges and the UW into one center is already well underway with positive signs that this can be overcome.

Funding: *What is the estimated cost of this initiative, in phases beginning with design, the "ramping up" phase, and then for ongoing annual costs? Note alternative sources of funding for each phase.*

Two funding requests have recently been made. One to Senator Murray, another to Senator Cantwell. A department of Labor grant is in the works. Additional funding requests will be required along with matching funds from industry and educational institutions. Approximate costs are \$250,000 the first year in addition to donated or reduced rent space and matching/leveraged funding from industry and colleges. This is based on lab space already available and does not include estimates associated with building out labs.

Outcome/Results: *How will know that we have achieved our objective? How will we evaluate whether or not we have been successful?*

Success will be based on numbers served, new hires, wage progression, coordination of K-12 programs, industry satisfaction with programs, and other industry driven outcomes.

Action Steps: <i>Describe the initiative in specific steps: Tasks (What, Who, When).</i>
1. Secure industry support at the Prosperity Partnership Life Sciences Cluster group.
2. Develop a Business Plan that includes scope, partners, location, budget, start-up and sustainability plan.
3. Host an industry meeting(s) to collect feedback and seed money to support the training center business plan.
4. Investigate center space location while business plan is being developed.
5. Funding campaign is launched.

Timeline: <i>Provide a rough schedule of activity for each step above and the lead person for each task. (Example: Establish implementation team/Jones, Hold first planning meeting/Johnson, Prepare concept/funding proposal/Smith, dates).</i>		
<i>Step</i>	<i>Key Person</i>	<i>Timeline</i>
1. Life Sciences Workforce subgroup presents plan to larger group	Theresa Britschgi (chair) Helena Haas (WDC)	
2. Development of a Business plan with more details	Sandy Clark, Helena Haas (WDC), Education and other industry partners	4-6 months
3. Host industry panel	Life Sciences advisory team	One meeting before business plan is developed and one after business plan is completed in draft form (2 meetings total)
4. Investigate existing lab space(s)	Life Sciences advisory team members and Vulcan	1-6 months
5. Secure funding	Life Sciences advisory team members	1-12 months

Other action steps/implementation timing issues:
The Life Science Training Center partnership will apply for several Federal grants over the next 12 months, including one due July 1 st . This DOL grant proposal is for \$2 million and will include an invaluable partnership of educators, Life Science industry, and workforce training organizations.