

Green Training Performance System: A System for Tracking and Reporting on Green Training and Outcomes at Oregon Community Colleges



Picture by Author

Tammie Stark, MA, ARCSA-AP Oregon Department of Community Colleges and Workforce Development Salem, Oregon September 2011

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EXECUTIVE SUMMARY

The Green Training Performance System (GTPS) final report provides information about green training in Oregon's community colleges. The Oregon Labor Market Information (LMI) Grant was funded by U.S. Department of Labor's Employment and Training Administration. Grant partners included Oregon Employment Department, Oregon Career



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Information System, Oregon Department of Community Colleges and Workforce Development and the Oregon Workforce Investment Board. A rich history of collaboration provided a solid foundation for our projects, which together created tools for students to plan their green education and career.

Green training is available in nearly every state, but rarely inventoried. We used the Oregon's definition of green jobs to guide a definition of green training and green screening metric. This *enabled measurement of green content in community college classes*.

The Green Training Performance System (GTPS) tracks green-trained students along their respective pathways, from community college to post-graduation jobs. The GTPS is a system to collect green course and program data. The underlying infrastructure is database

software and the human processes include formal and informal curriculum review. After much work, new practices emerged. For example, all colleges decided to update and use existing curriculum review processes to screen classes for green content.

College Green Leads and CCWD staff reviewed thousands of course sections across three academic years based on six new database fields. The fields included a percent green designation and five green training categories to create the green screening metric. To calculate a percent we asked, how likely is it that a course leads to a green job? To answer, we reviewed learning outcomes and estimated a percent green. We defined a green course as one that has 10% or more green content. Then Green Leads categorized green course subject matter into five categories and CCWD compiled and analyzed the results.

We found that Oregon's community colleges offered 1,928 green course sections in 2008/09 and 2,046 green course sections in 2009/10 (except Adult Basic and Secondary Education). This represents about 2.28% of all course sections. We discovered that more green course sections covered environmental topics than energy efficiency and renewable energy combined. We looked at green course sections and found that 1,087 of all green sections were career/technical classes while 1,348 sections were lower division collegiate course sections. The latter fact was a surprise. One clear trend was that students received green training in a wide variety of areas rather than in a few top industries.

We uncovered 21,582 students who received some green training in 2008/09 and 24,355 in 2009/10. We turned to student demographics and found noteworthy trends in statistics by gender and race. We determined that significantly more green-trained students were male as compared to female. We noted a significantly greater percent of white students were green trained as compared to other race/ethnicities and Hispanics the most underserved.

We reviewed the green-trained students (with 30 hours or more of green training) by industry of employment by industry for 2008/09 and 2009/10. We determined that the top 5 industries to add the greatest number of green-trained students were Administrative and Support Services, Nursing and Residential Care Facilities, Administration of Environmental Quality Programs, and Ambulatory Health Care Services and Repair and Maintenance. Finally, we created a **preliminary** summary of students that completed a green program, and noted that 114 students with 30 or more green training hours completed a green program in 2008/9 and 2009/10.

Two achievements stand out. First, 17 of 17 colleges now include screening for green content as part of a regular curriculum review process. That means green data will now be submitted regularly. Second, all colleges determined they would use an existing curriculum review process to screen classes for green content. In summary, measure what you treasure. If we treasure green training, we must measure it – now and into the future.

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SECTION 1: INTRODUCTION, BACKGROUND AND CONTEXT

This section includes who should read this report, an overview of the project and grant partners. It places the project within context, identifies scope, definitions and features.

This report provides information about the green training in Oregon's community colleges and will benefit several groups. Educational administrators may find it informs the development of green courses and programs and helps set priorities. Faculty could be inspired to incorporate more green curricula into their classes. Policy makers may need fodder to bolster ongoing funding. General interest readers might like a statewide briefing on green training. Oregon Community College Presidents, Deans and green leaders can use it to reveal and enhance their competitive advantage. Green industry professionals will find that it sparks innovative ideas. We all can read it and celebrate success because it portrays hard-working people who care about the world enough to take action. The appendices provide further resources. We also hope that it enhances the green dialogue, models a replicable statewide process and generates further questions.

Grant Partners and How Project Supports Previous Efforts

Here we explain grant partners and how this work continues previous statewide efforts.

The U.S. Department of Labor's Employment and Training Administration generously awarded grant funding to the Oregon Employment Department through the American



Recovery and Reinvestment Act., As shown in Figure 1 below, funding and relations were managed by the Oregon Employment Department (OED), in partnership with the Oregon Career Information System (CIS), Oregon Department of Community Colleges and Workforce Development

(CCWD) and the Oregon Workforce Investment Board (OWIB). The grant partners' working group provided crucial guidance.

This Labor Market Information (LMI) Grant provided for four main projects: WorkKeys®, Career Pathways, the Green Training Performance System (GTPS) and Oregon Career Information Systems (CIS) enhancements. The WorkKeys® project created information to compare green and non-green job skills. Green Career Pathways details the skills necessary to perform green jobs and training available (<u>www.oregongreenpathways.org/</u>). CIS provides a one-stop education- and career-building tool (<u>http://oregoncis.uoregon.edu</u>). Together, these projects made tools for students to plan their green education and career.

The GTPS is part of the state database, OCCURS. The Green Training Performance System (GTPS) enables tracking of green-trained students along their respective pathways, from community college to post-graduation jobs.

The system supports previous statewide work to develop comprehensive information about green training and jobs. Such work includes the Oregon State Board of Higher Education's *Sustainability Initiatives Committee, Final Report* (2010), which reviewed sustainability in the Oregon University System. The GTPS continued work reported in *The Oregon Community College Green Initiative* in several ways (CCWD, 20 May 2010). It created an inventory of green classes and programs, which can identify gaps in workforce training. The GTPS illustrated how community colleges are role models for sustainability by offering green curriculum. Lastly, the project facilitated sharing and best practices across the state. Finally, the GTPS Project bolstered the *Oregon Community Colleges Student Success Plan: Measure What You Treasure*, (CCWD, September 2008) by supporting the collection and analysis of longitudinal data to inform decisions, or creating a culture of evidence.

Project History and Definitions

A rich history of collaboration provided a solid foundation for this project including:

- A history of regional green/sustainability conversations at many levels
- A starting place with The Oregon Community College Green Initiative
- A committed group of community college personnel advocating for green
- A push from community college students to implement more green initiatives

Currently, three main groups request GTPS reports from CCWD: the Oregon legislature, CCWD management and the community college personnel. Ongoing stakeholder discussions will determine how future green data and reports will be used.

Definitions are crucial to understanding the GTPS Project context and scope. Here we defined "sustainability," "green," "green job," "green training," "green program" "green course" and "course section" as well as "green-trained student."

These days, sustainability reaches far beyond the everyday use of the word, to sustain. It requires simultaneously meeting environmental, economic and community needs, as illustrated in Figure 2 at right. The Oregon Department of Administrative Services defines sustainability as "using, developing and protecting resources in a manner that enables people to meet current needs and provides that future generations can also meet future needs, from the joint perspective of environmental, economic and community objectives" (ORS 184.421, 2009). An

Figure 2: Elements of Sustainability



example of a sustainability assessment tool might include STARS, the Sustainability Tracking and Assessment Reporting Tool created by the Association for the Advancement of Sustainability in Higher Education. *The GTPS provides specific green course and program information that can be a part of broader tools like STARS.*

Many states and the federal government defined the term "green job." In Oregon, a "green job" has five specific components focused on energy and the environment, as seen in Figure 2 below. For this report, we defined "green" in the same way. The existence of a state definition proved beneficial. It facilitated the creation of clear green categories, helped

Figure 3: Oregon Definition of a Green Job



build acceptance and saved time. Most importantly, it provided a clear metric to screen classes.

Unlike sustainability, green training, is specific and includes environmental and economic matters, not social equity. This green focus enabled measurement of green content.

We informally defined "green program" and "green training" for this project. A green program is, "a state-approved and recognized certificate or degree program of any length (e.g. Associate of Applied Science, one-year certificate) that includes green content." Green training is, "any series or grouping of courses that includes green content and is longer in duration than one course, but is not a formal state program." The term green training may also be used generally and include any green classes, green instruction or green programs.

A "green course" is a class that has 10% or more green content, for instance, Introduction to Wind Turbines. A "green course section" refers to a specific offering of a green class, say Introduction to Wind Turbines, held on Tuesdays at 3:00 p.m., fall term. We used green course sections rather than courses when reporting statistics.

Because one credit equals about 33 contact hours, we defined a *"green-trained student"* as a student that attended 30 or more hours of green training. With 30 hours, a student can complete the Climate Master's Program, for example. We now move to project context.

Project Context

Although Oregon boasts a robust green economy, we have not known *what type or extent* of green training exists at the community college level. The GTPS provides an inventory of community college green classes throughout time. The *GTPS goal is to measure the rate at which green-trained students are getting green jobs*. The GTPS provides information about community college green training that prepares students for green jobs and can documents students' paths into completions, further education and green jobs. To meet the goal, GTPS data was matched with green jobs employment data.

Key features of the Green Training Performance System:

- It provided a consistent assessment of green courses and programs
- It created a benchmark for green courses and programs
- It built on previous green strategies and goals
- It is part of the larger, time-tested and frequently used statewide database
- It is aligned with broader sustainability assessment tools (e.g. STARS)

The grant included a financial incentive of \$5,000 to each community college no matter the student enrollment or school size. Originally, colleges were requested to provide green course percent and category for all 2008/9 and 2009/10 course sections; identify all green programs and; draft a plan to provide updates to this data. Subsequently, the grant was extended. The extension allowed us to gather green data for an additional year, 2010/11.

Group Process, Roles and Responsibilities

A GTPS Coordinator developed and managed the project to meet project outcomes of data gathering and reporting. The OCCURS Executive Director supervised and the grant

partners' working group provided essential feedback. Community College Green Leads represented each school. Together, we established scope and honed the screening metric.

The Coordinator and Executive Director hosted two statewide meetings. At the first, Green Leads agreed that *course learning outcomes must reflect green course content*. If so, then green content can be identified and the learning can be assessed. Green Leads set a 10% threshold for green courses, meaning *green courses must have 10% or greater green content*. Green Leads were charged with green flagging all credit and non-credit courses and verifying green programs identified by the Coordinator. *Green flagging, also called green screening, is the identification, classification and categorization of green content*. Green Leads noted the need to update course learning outcomes. The group met regularly.

Once green courses, programs and green-trained students were identified, a wage match matched GTPS green course data to Oregon Employment Department green jobs data.

SECTION 2: THE GREEN TRAINING PERFORMANCE SYSTEM

This section describes the GTPS infrastructure, human processes and screening metric.

Infrastructure and Human Processes

The GTPS is a system to collect data. The system includes both infrastructure and human processes. The underlying *infrastructure is database software*, including the state database and all 17 community college databases. The state database was OCCURS. The schools used various databases such as Banner, DataTel or RogueNet. The *human processes include formal and informal curriculum review*. The processes varied at each school and gathered expert opinion from deans, faculty and others.

Colleges were asked to rank and categorize all green courses. Green Leads were motivated to make the new data gathering automatic for feasibility and continuation.

After much work, new practices emerged. For example, a Green Lead suggested using existing curriculum reviews. Once surfaced, other Green Leads introduced the idea at their campuses. In the end, *all colleges used an existing curriculum review process to screen classes for green content.* For some that meant revised paperwork, work with committees and faculties, for others it meant one person flagged all data. In one far-sighted move, Green Leads institutionalized a process to gather and report green data into the future.

Green Screening Metric and Data Gathering

To track green classes and programs, green screening information was loaded into databases using six new database fields:

- Percent green
- Energy efficiency
- Renewable energy

- Prevent environmental degradation
- Restore the environment
- Support activities

These new fields, also shown in Table 1 below, included a percent green designation and five green training categories (from the green jobs' definition) to create the metric. *Green flagging is estimating a percent green and checking all green categories that apply.*

Table 1: Green Screening Metric and Example Green Flagging

Percent Green	Green Training Categories: Check all that apply					
Percent of class that may lead to a green job (1-100%)	1. Increase energy efficiency	2. Produce renewable energy	3. Prevent, reduce, or mitigate environmental degradation	4. Clean up and restore the natural environment	5. Educate, consult, and provide other services that support 1-4	
10%		V			\checkmark	

Green Leads screened courses for green content using this metric. They asked how likely is it that a course leads to a green job? What categories are covered? For example, an instructor used one week of ten to discuss renewable energy as well as measure and quantify energy use, which translated to 10% green in Categories 2 and 5.

The screening process it is a state guideline developed with input from community colleges to screen for green classes. The actual process at each community college may vary. The Coordinator and Green Leads used this metric to screen thousands of course sections across three academic years. The information provides a snapshot of dynamic curricula.

SECTION 3: METHODOLOGY

This section provides a detailed look at green screening and data collection.

Note that we gathered data on green course content but not on teaching methods, which is beyond the scope of this report. The first step of data gathering: *identify all course sections*. The Executive Director used OCCURS to generate spreadsheets that included course identification, course name, section number, term and year. The spreadsheets *included credit and non-credit course sections for all 17 community colleges*.

We excluded Adult Basic Education, General Educational Development, English as a Second Language, Adult High School Program and other adult basic skills classes except Post Secondary Remedial course sections, areas with little to no green content.

The Coordinator created customized spreadsheets for each college and each academic year. Spreadsheets included instructions and examples. She then previewed and marked potential green course sections and sent a copy to each Green Lead.

Green Leads estimated a percent green and categorized green content for each green course section. Green Leads reviewed course descriptions and learning outcomes, interviewed faculty and worked with committees to screen green course sections.

For the most part, credit classes were well documented. Non-credit course information was less accessible. Some colleges used the same class number for very different classes year to year. These sections could not be tracked, but represented less than 1% of all data.

Estimation of Percent Green

To calculate a percent Green Leads asked, *how likely is it that a course leads to a green job?* To answer, they reviewed learning outcomes. A *common method was to use a ratio of green to non-green learning outcomes.* For example, if a course with one of ten learning outcomes was green, the class was estimated 10% green. This simple method assumes that the same amount of class time was spent on each learning outcome.

Table 2 below illustrates another simple percent green estimation method based on a 7point Likert Scale from "not likely" to "most certainly." Green Leads used the table to transfer qualitative learning outcomes to a quantitative percentage. Green Leads used one of these methods or another reasonable method.

Table 2: Liker	Scale to	Guide	Estimated	Percent	Green
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			•	
%		Likelihood	Course Name	Course Learning Outcome
0-15	}	Not likely	Technical Math	Calculate solar energy availability
16-30	}	Slightly likely	Fuel Systems	Reduce emissions and consumption
31-45	}	Somewhat likely	Energy and Resource Technology	Discuss challenges of renewables
46-60	}	Likely	Chemistry in Context	Test air and water quality
61-75	}	Moderately likely	Resource Measurement	Measure and quantify energy use
76-90	}	Very likely	Wildlife Conservation	Describe water conservation practices

How likely is it that the training will lead to a green job or "green" an existing iob?

91-100	}	Will most certainly	Solar Panel Installation	Design and install photovoltaic system
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After the first review of courses, we discussed green courses with 1-9% green content and the Green Leads agreed upon a 10% threshold. We therefore *defined a green course as one that has 10% or more green content*. After determining the percent green, Green Leads categorized green course subject matter into five categories.

Application of Green Training Categories

Green Leads identified green courses, reviewed learning outcomes then categorized subject matter. To categorize, they selected *which green category or categories best encompassed learning outcomes*. If a class taught multiple green topics, they checked all categories that applied. To provide examples of learning outcomes found in each green category, we made a detailed table, similar to that shown in Table 3 below. The table illustrated the five green categories and example green learning outcomes. Some learning outcomes can easily appear in all categories, like "Apply regulations," "Use industry terminology," or "Obtain industry certification." We excluded these general outcomes.

1. Increase energy efficiency	2. Produce renewable energy	3. Prevent, reduce, or mitigate environmental degradation	4. Clean up and restore the natural environment	5. Educate, consult, and provide other services that support 1-4
Perform building commissioning Practice or increase awareness of energy efficiency Re-engineer practices, processes, products for efficiency Install efficient appliances such as WaterSense or Energy Star	Design, implement or advocate for strategies to produce, supply, distribute or use renewable energy Explain the dis/advantages of traditional and alternative fuels or crops (such as: biofuel, biomass, co-generation, fuel cells, geothermal, hydro, methane capture, ocean)	Prevent pollution Preserve, conserve or minimize use of or impact on habitat, ecosystems, environment or natural resources Prevent or minimize human impacts Reduce "waste" Safeguard water, ecosystems or natural	Restore natural environment Rehabilitate or restore soil, land, ecosystems, habitats Reuse, recycle, restore materials Use recycled or "waste" materials in new ways Clean up hazardous sites, materials	Design or use field sampling methods Evaluate environmental data Evaluate human impact on the environment Quantify impact of buildings on the natural environment Engage in organic agriculture Use carbon

Table 3: Green Training Categories and Example Green Learning Outcomes

1. Increase energy efficiency	2. Produce renewable energy	3. Prevent, reduce, or mitigate environmental degradation	4. Clean up and restore the natural environment	5. Educate, consult, and provide other services that support 1-4
Perform weatherization Use or promote programmable thermostats or programmable irrigation timers Apply embodied energy concepts Perform building retrofits	hybrid vehicles Evaluate qualitative and quantitative impacts of non/renewable energy sources, distribution or uses	environment Deconstruct and reuse building materials Practice environmentally conscious design, manufacturing, shipping Eliminate or reduce	Restore brownfields Mitigate stormwater Apply principles of phytoremediation or bioremediation Restore buildings, autos,	markets Advocate for public transit Explain legal aspects of wildlife management Apply climate or eco-literacy concepts
		hazardous materials	environments, habitats, communities	

We interpreted two categories broadly. In the energy efficiency category, we included learning outcomes that lead to energy *or* natural resource-use efficiency. The logic is, if natural resources are used more efficiently, energy is likely saved. For example, when less water is used, not only is less energy used for pumping and purifying water, but also less infrastructure is built, fewer emissions released, less water is removed from the watershed.

We interpreted the produce renewable energy category, more broadly than simply production. It included strategies to produce, supply, distribute or use renewable energy as well as increased awareness. This allowed us to capture training that increased green knowledge, skills and/or abilities. A narrow view would discount many relevant sections.

Although we provided many examples to the Green Leads, naturally the interpretation of the categories varied to some degree. We hope that over time, the green screening processes will be refined by the community colleges themselves.

SECTION 4: KEY FINDINGS

This section provides a look at the green training data and the meaning of the data.

We first posed questions about green training, ran sample reports and analyzed the data to answer our questions. This section answers the most common questions asked like:

- How many green course sections were offered? In what categories? How do the green training categories compare?
- What are the top 10 courses in terms of enrollment?
- How many students have been green-trained? In what categories?
- How many hours of green training have students received?
- What are the demographics of green-trained students?
- How many green programs were offered across the state?
- What type of academic programs offer the greatest/least number of green courses?
- How many students completed a green program?

Policy makers can use the data to inform decisions about many questions such as, are we green-training sufficient students to meet our goals? What minority groups need the most green-training support? Which programs do we need to shore up? What is our competitive green advantage? Which programs can we market now? Do we train in the business sectors of our local green companies? What new green businesses or industries need green-trained students in our area?

Before we answer the first set of questions, recall that a green course *must have 10% or greater green content.* The one exception is for statistics on green training attended so students received full recognition. Next, we defined a green-trained student as one that attended at least 30 hours of green training.

Green Course Sections

Now, how many green course sections were offered? As Table 4 below shows, during 2008/09 Oregon's community colleges offered 1,928 green course sections (except Adult Basic and Secondary Education), or 2.28% of all course sections.

Number of Green Course Sections with 10% or Greater Green						
2008/09 2009/10 2010/						
Count of Green Sections with 10% or Greater Green Content	1,928	2,046	2,302			
Percent of Green Sections with 10% or Greater Green Content (as a percent of all sections)	2.28%	2.27%	2.54%			

Table 4: Number of Green Course Sections with 10% or Greater Green Content

The number of green course sections increased the next two academic years. The percentage stayed flat from 2008/09 to 2009/10 because non-green sections increased



Figure 4: Green Course Sections with 10% by Green Training Categories

slightly faster than green sections.

We then looked at green training categories, which showed the predominance of green course sections dealing with the environment. With the prevalence of energy efficiency classes, it is *surprising to see that more green course sections cover environmental topics than energy efficiency and renewable energy combined*, as shown in Figure 4 above.

Next, we differentiated green course sections using the National Center for Education Statistics' (NCES) Classification of Instructional Programs (CIP) codes. As shown in Table 6 below, *Biological and Physical Sciences dominated during 2008/09* while *the next year*, *Engineering represented* a greater number of green course sections than Physical Sciences. Agriculture, Mechanics and Repair, along with Natural Resources program areas rounded out the top six categories.

A contributing factor to the high number of green course sections in Biological Sciences was the green flagging of some atypical biology class sections. Typical community college basic biology classes do not explicitly cover green-related topics such as population ecology, community ecology, biomes, interconnectedness and ecosystems as does this course. This factor will play a part with other statistics discussed later.

Classification of Instructional Programs (2-digit level summary)	Green Course Sections, 2008/09	Green Course Sections, 2009/10
BIOLOGICAL AND BIOMEDICAL SCIENCES	369	333
PHYSICAL SCIENCES	247	227
ENGINEERING TECHNOLOGIES AND ENGINEERING-RELATED FIELDS	208	282
AGRICULTURE, AGRICULTURE OPERATIONS, AND RELATED SCIENCES	160	228
MECHANIC AND REPAIR TECHNOLOGIES/TECHNICIANS	159	156
NATURAL RESOURCES AND CONSERVATION	129	181
HOMELAND SECURITY, LAW ENFORCEMENT, FIREFIGHTING AND RELATED PROTECTION	113	83
LEISURE AND RECREATIONAL ACTIVITIES	73	50
CONSTRUCTION TRADES	71	81
LIBERAL ARTS AND SCIENCES, GENERAL STUDIES AND HUMANITIES	68	63
PRECISION PRODUCTION	68	69
BUSINESS, MANAGEMENT, MARKETING, AND RELATED SUPPORT SERVICES	57	58
SOCIAL SCIENCES	54	51
ENGINEERING	51	71
PARKS, RECREATION, LEISURE, AND FITNESS STUDIES	31	29
PERSONAL AND CULINARY SERVICES	17	17
HEALTH PROFESSIONS AND RELATED PROGRAMS	13	13
MATHEMATICS AND STATISTICS	7	8

Table 5: Number of Green Course Sections with 10% or Greater Green Content by CIP

Classification of Instructional Programs (2-digit level summary)	Green Course Sections, 2008/09	Green Course Sections, 2009/10
AGRICULTURAL SCIENCES	6	6
PHILOSOPHY AND RELIGIOUS STUDIES	6	7
Invalid CIP code	5	3
VISUAL AND PERFORMING ARTS	5	5
COMPUTER AND INFORMATION SCIENCES AND SUPPORT SERVICES	4	0
BASIC SKILLS AND DEVELOPMENTAL/REMEDIAL EDUCATION	3	7
EDUCATION	1	3
FAMILY AND CONSUMER SCIENCES/HUMAN SCIENCES	1	5
MULTI/INTERDISCIPLINARY STUDIES	1	2
PERSONAL AWARENESS AND SELF-IMPROVEMENT	1	3
INTERPERSONAL AND SOCIAL SKILLS	0	5
Total	1928	2046

Next, we looked at green course sections from an academic angle using OCCURS' Activity Codes, or types of educational programs, as shown in Figure 5 below.

Figure 5: Number of Green Course Sections with 10% or Greater Green Content by OCCURS Activity Codes, or Educational Program



Education types included Non-Reimbursable, Adult Continuing Education, Postsecondary Remedial, Career/Technical Education (CTE) Apprenticeship, CTE Supplemental, CTE Preparatory and Lower Division Collegiate. It is likely not surprising that *a multitude of green Career/Technical Education course sections existed.* This demonstrates the importance of career/technical training in the new green economy. In contrast, *it may have been unforeseen that many Lower Division Collegiate course sections were flagged green.*

As shown, students received green training in a wide variety of areas rather than in a few top categories. Below, we used the NCES CIP codes to distinguish instructional programs, but this time we viewed enrollment in green course sections with 10% or greater green content, as shown in Figure 6 below.

Figure 6: Students Enrolled in Green Course Sections with 10% or Greater Green Content by NCES CIP Codes



As seen in the figure above, *enrollment is greatest in Biological and Physical Sciences, Agriculture, Engineering and Natural Resources and Conservation.* Again, a contributing factor to the high enrollment in Biological Sciences was the green flagging of some atypical biology class sections, as discussed earlier.

Green Training Students Received

Next, we considered how many hours of green training students received, as shown in Table 6 below. In 2008/09 there were 21,582 students who received some green training and in 2009/10, the figure increased slightly to 24,355. As a percent of all students, that represents 5.7% and 6.3%, respectively.

Table 6: Number and Percent of Students that Received Green Training by Hours Attended

	2008	8/09	2009/10	
Hours of Green Training Received	Number of Students that Received Green Training	As a Percent of All Students	Number of Students that Received Green Training	As a Percent of All Students
Received No Green Training	359,671	94.3%	359,904	93.7%
Less than 10	10,808	2.8%	11,578	3.0%
10-19	3,049	0.8%	4,011	1.0%
20-29	2,527	0.7%	2,988	0.8%
30-39	1,934	0.5%	1,563	0.4%
40-49	862	0.2%	989	0.3%
50-59	348	0.1%	621	0.2%
60-79	1,018	0.3%	1,146	0.3%
80-99	290	0.1%	426	0.1%
100 or more	746	0.2%	1,033	0.3%
Students who Received some Green Training	21,582	5.7%	24,355	6.3%
Green-Trained Students with 30 or More Hours	5,198	1.4%	5,778	1.5%
Total Number of Students	381,253	100%	384,259	100%

However, when we looked at green-trained students, or *students who have attended 30 or more hours of green training there were 5,198 in 2008/09 and 5,778 in 2009/10.* That means about 1.5% of the student body received significant green training.

Comparatively, about 3% of all Oregon jobs are green according to the *Greening of Oregon's Workforce* report (Oregon Employment Department, June 2009).

	Gender		
	Green-Trained Students	Female	Male
2008/09	As a Percent of Students Who Received Some Green Training	42%	57%
	As a Percent of All Students	51%	44%
09/10	As a Percent of Students Who Received Some Green Training	38%	61%
20(As a Percent of All Students	51%	44%

Table 7: Percent of Green-Trained Students by Gender

When we turned to student emographics, we found oteworthy trends in terms of ender as shown in Table 7 at left. Muthough 51% of all students were emale, only 42% in 2008/09 and 88% in 2009/10 were green rained. That means significantly nore green-trained students were male as compared to female.

When we moved on to race demographics as shown in Table 8 below, we noted the there was a significantly greater percent of white students that were green trained as compared to other race/ethnicities. White students represented 77.42% of all students, but white students made up 83.89% of the green-trained students. Asian, Black, Hispanic, Native American and International races/ethnicities were underserved. These data depict an opportunity to green-train minority populations.

		Nativa				
	Asian	Black	Hispanic	American	White	International
Percent of Green-Trained Students, by Race/Ethnicity	4.52%	1.91%	6.36%	2.29%	83.89%	1.02%
Percent of All Students, by Race/Ethnicity	4.96%	2.72%	12.08%	2.16%	77.42%	0.65%

Table 8: Percent of Students by Race/Ethnicity (Excluding "Unknown" Race/Ethnicity Category), 2008/09

Difference (Percent of All Students minus Percent of		5.72%	-0.13%	-6.47%	-0.37%	
Green-Trained Students)						

After that, we analyzed the number of completions in green programs, shown in Table 9 below. The **preliminary data** show that 174 students completed green programs.

There are several data caveats. Green programs and completions of these programs were classified by CIP codes plus 2 additional code characters, but program codes supplied often do not entirely correspond to the codes we have listed for approved programs (Green programs and otherwise). This lack of complete correspondence hinders our ability to match program completion data to the Green program list. Also, if a student had more than one completion in 0809 through 0910, all completions were counted and reported in the CIP below. In brief, these **completion data are incomplete**. Future work on data accuracy in OCCURS data submissions is required to calculate more precise completion data.

2010 CIP (Classification of Instructional Programs), Program Title	Green Program Completions in 2008/09 and 2009/10
Electrical, Electronic and Communications Engineering Technology/Technician	87
Water Quality and Wastewater Treatment Management and Recycling Technology/ Technician	36
Forest Technology/Technician	12
Environmental Engineering Technology/ Environmental Technology	10
Landscaping and Groundskeeping	9
Environmental Studies	6
Industrial Mechanics and Maintenance Technology	6
Environmental Design/ Architecture	3
Industrial Engineering	3
Fire Science/Fire-fighting	*
Water, Wetlands, and Marine Resources Management	*
Total Number of Green Program Completions	174

Table 9: Number of Completions in Green Programs by CIP Codes

*Cell size too small for publication

In the next data study, we reviewed the 5,198 green-trained students by industry of employment using the North American Industry Classification System (NAICS) industry categories. We performed a match of green-trained students to green job category by industry of employment.

Then, we listed industries of employment prior to green training (pre) and two periods after green training was received (post 4th quarter 2009 and post 4th quarter 2010). As shown in Table 10 below, we observed increased industry employment figures from 4th quarter 2009 to 4th quarter 2010. During this time, *the count of green-trained students increased two periods in a row. This upward trend occurred in 9 industries of employment.* Health care industries were prevalent in this group. Factors likely affecting these data include the aging population, the stagnant economy as well as green-training of students.

Table10: Number of Green-Trained Students with Upward Trend Prior to GreenTraining and Post Green Training in Industries of Employment

	PRE	POST1	POST2	Change Over Time		
Industry of Employment	Number of Green- Trained Students (Q2 2008)	Number of Green- Trained Students (Q4 2009)	Number of Green- Trained Students (Q4 2010)	POST1 less PRE	POST2 less POST1	
Nursing and Residential Care Facilities	54	78	81	24	3	
Administration of Environmental Quality Programs	9	26	34	17	8	Row
Repair and Maintenance	21	35	42	14	7	а С
Ambulatory Health Care Services	39	50	63	11	13	iods ir
Executive, Legislative, and Other General Government Support	103	110	119	7	9	end 2 Per
Professional, Scientific, and Technical Services	72	79	89	7	10	ard Tr
Health and Personal Care Stores	14	20	25	6	5	Upw
Beverage and Tobacco Product Manufacturing	5	11	20	6	9	
Hospitals	42	47	60	5	13	

Later, we used the same period-to-period comparison and the same student group. We witnessed *a downward trend in 18 industries* in which green-trained students worked.

Again, we used the data and determined that the top 5 industries to add the greatest number of green-trained students were Administrative and Support Services, Nursing and Residential Care Facilities, Administration of Environmental Quality Programs, and Ambulatory Health Care Services and Repair and Maintenance. The industries contracting the most were Food Services and Drinking Places, Specialty Trade Contractors, Food and Beverage Stores, Clothing and Clothing Accessories Stores and Amusement, Gambling, and Recreation Industries.

Lastly, we created a **preliminary** summary of students that completed a green program organized using Classification of Instructional Programs (CIP) Codes. The facts do not yet detail when students started programs. These students are not a part of a cohort.

Table 11: Green Program Completions in 2008/09 and 2009/10 with Number ofStudents Enrolled in 30+ Hours of Green Training in 2008/09



These data in no way depict a completion rate. The data in Table 11 above, did illustrate that *114 students with 30 or more green training hours completed a green program* in 2008/9 and 2009/10. Further, these preliminary summary data are conservative estimates. Future refinement of programs data and additional research is necessary to refine the number of students completing green programs. From Key Findings, we move to a discussion of project limitations, potential resolutions and further research needed.

SECTION 5: STUDY LIMITATIONS, RESEARCH NEEDED

In this segment, we provide a quick look at study limitations and suggestions to mitigate limitations, research needed and additional questions.

Study Challenges, Limitations and Potential Resolutions

The primary challenge was overworked Green Leads likely due to under-funded education statewide and federally. *Policy-makers must fully fund education.*

This study focused on green job placement as one measure of success. However, students and colleges have a wide array of goals. Suggestion: Use caution when drawing conclusions with any data. Use GTPS data with other measurements of success. Consult with stakeholders to interpret data. Consider using additional measurements.

The main study limitation was different green flagging methods at community colleges. Suggestion: *Support statewide stakeholder gatherings to peer-review flagging from college to college and course to course; identify and eliminate inconsistencies.* Example limitations:

> Estimated percent green may vary from college to college for nearly identical courses (e.g. S-390 Wildland Fire Behavior Class)

"Success is to be measured not so much by the positions that one has reached in life as by the obstacles which he has overcome."

-Booker T. Washington

- Category 5, Educate, Consult, and Provide Other Services, interpreted to include learning outcomes that were better placed in categories 1-4
- Inconsistent flagging of co-operative education classes

Non-credit courses were difficult to green flag due to less documentation, little or no peer review required, decentralized or informal review processes, discipline and division separations. Suggestion: *Provide examples of green non-credit course descriptions and learning outcomes; encourage sharing best practices.*

In some cases, non-credit course numbering did not provide unique course numbers. Some colleges use the same course number for very different classes year to year, meaning some non-credit green course sections were not reported. Suggestion: *Build a consensus-based non-credit course numbering system.*

In a few cases, community college green flagging methods were not well documented. Suggestion: *Encourage colleges to document and share their internal green-flagging process and methods, facilitate collaboration.*

Sometimes, course sections were flagged based on sustainability rather than on job-related green training. Most green courses were flagged; however, some were missed (e.g. solar). Suggestion: Consider building support for statewide use of sustainability assessment at all public education systems. Provide examples and facilitate collaboration.

The short time line of the project hampered additional *collaboration and consensus-based decision-making*. Foster future opportunities to do so.

In some cases, out-dated course learning outcomes did not reflect green content. Suggestion: Provide forum for exchange of ideas/best practices and collaboration. Encourage colleges to update outcomes and hone their green competitive advantage.

Efforts to match green-trained students to green programs and create completions data, was significantly impeded by coding issues. Suggestion: *Perform detailed program information audit* of community college and state data, solicit input from stakeholders and identify unique program codes.

Future Research Needed

This portion of the report outlines a few areas where additional research is necessary.

- Research how other states' community colleges have dealt with non-credit course documentation, numbering systems, statewide collaboration, etc. Study their green and/or sustainability labeling methods, definitions and implementation procedures.
- Carry out additional research on program completions, disseminate information and implement best practices.
- Explore how this data collection system may be used to link credit and non-credit curricula, if possible. Examine whether or not it is reasonable to link K-12 and community college curricula.
- Answer additional questions about green training.
- Track enrollment from specific course sections to jobs; collaborate with Employment Department.

SECTION 6: RECOMMENDATIONS

This section lists recommended actions.

 Host statewide gatherings and working sessions for Green Leads and other stakeholders.
 Facilitate in-depth peer-review of green flagging and encourage sharing across institutions.
 Provide example materials and additional resources.

"The freethinking of one age is the common sense of the next."

-Mathew Arnold

• Expand statewide environmental and ecoliteracy efforts. Persuade policy-makers to fund education.

- Create/update unique program codes for each college program including CIP and college extensions, then refine OCCURS programs file.
- Use caution when drawing conclusions with GTPS data. Use the data along with other measurements of success. Consult with stakeholders to use data.
- Request green training data reports from CCWD at least annually. Present findings to Oregon Legislature, Governor and association meetings.
- Measure what you treasure. If we treasure green training, we must continue to measure it.
- Integrate social equity and global citizenship into community college credit and noncredit training.
- Encourage community colleges to integrate activities to enhance students' soft skills.
- Use WorkKeys® job profiles and in conjunction with GTPS data to modify current green curricula and/or create new curricula. Collaborate with Oregon Employment Department to align green workforce training with green jobs.
- Develop a uniform transcript for noncredit workforce courses.
- Provide educational institution access to "Implement Greening Your Curriculum" or similar train-the-trainer workshops focused on green and sustainability content.
- Bolster bioregional communication, collaboration and leveraging of resources. Use California's *Understanding the Green Economy* as a model (June 2009).
- Support business, community college and community partnerships to create and maintain living laboratories that teach students green technologies and practices.
- Create links between the GTPS and environmental literacy as described in the Oregon Environmental Literacy Plan for K-12 schools (Oregon Legislative Assembly House Bill 2544). Encourage younger students to "ladder up," or follow career pathways into college and beyond. Support the Environmental Literacy Plan main goal, "prepare students to understand and address the major environmental challenges facing this state and country, including the relationship of the environment to nation security, energy sources, climate change, health risks and natural disasters," (24 June 2009, p 3).
- Teach change agent skills required for positive societal change. Develop students who can create new green practices, wise resource use and holistic land use.

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