WORK-BASED COURSES

BRINGING COLLEGE TO THE PRODUCTION LINE

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JOBS FOR THE FUTURE

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Two students are enrolled in different cohorts of the same Programmable Logic Controller (PLC) course at their local community college. The first student attends a lecture about contact and coil programming, then goes to the lab to write a PLC program that can stop or start a motor using a momentary-contact pushbutton along with a functional emergency stop cable.[1] She asks the instructor questions about what situations might require nonstandard instructions. The second student goes to his job at a manufacturing plant, where he helps his supervisor wire a panel and write a PLC program that trims the excess material off parts created on the production line.[2] He observes part of the process and leads part of the process, asking his supervisor questions about how the PLCs communicate with the drives. When he returns to the classroom, he asks the college instructor follow-up questions about when it is necessary to assign the same bit addresses to multiple coil instructions. The first student is enrolled in a traditional version of the PLC course, while the second is enrolled in a PLC work-based course.

WHAT ARE WORK-BASED COURSES?

Work-based courses are community college courses that have been redesigned in partnership with employers so competencies are taught not only in the classroom or lab but also through the job itself. The students are enrolled for credit at the college, but identify as workers who have the opportunity for intentional learning on the job. College faculty and employers start with an existing course curriculum and work together to determine how to teach the content, with both college faculty and employer supervisors or other employer mentors serving as instructors. Students are assessed on their mastery through both traditional means such as homework and tests and new methods like workplace checklists and hands-on demonstrations at work. The same work-based course will look different from company to company, reflecting each employer's unique production process and equipment.

The process of designing a work-based course begins by working with local employers to select an existing course that aligns with an employer's training needs and potential for learning in the workplace. For example, Owensboro Community and Technical College (OCTC) in Kentucky has been on the cutting edge of adapting many of its manufacturing courses to this model, with Industrial Maintenance Electrical Principles, Maintaining Industrial Equipment, and Electrical Motor Controls among the work-based courses most commonly offered in partnership with employers. Once a course has been selected, college faculty and employer representatives work together to identify the specific competencies that will demonstrate mastery of the course learning objectives, as well as determine the work activities that can be used to develop, demonstrate, and document competencies and skills. The college faculty then converts traditional curricula to work-based curricula to reflect the work-based instruction and develops an assessment strategy to allow employer supervisors to participate in evaluating a student's performance. The college faculty and employer supervisors or mentors jointly function as instructors. As much learning as possible takes place through a student's job responsibilities, which is then supplemented with classroom, online, or lab instruction.

WHAT'S THE BENEFIT OF WORK-BASED COURSES?

The innovative work-based course model offers value to all stakeholders:

- **Students** gain dual opportunities for career and educational advancement while working. Their training helps them perform immediately on the job, while also obtaining college credit and skills that can be transferred throughout the industry.

- **Employers** faced with training and retaining a skilled workforce can provide workers rigorous, academic training in a format that is tailored to their production processes and skill needs. In addition, work-based courses build long-term career pathways without requiring a long-term training commitment up front.

1. Kuphaldt, Tony. Lessons in Industrial Instrumentation. INST23X, Motor Controls and PLCs, pg 57. Downloaded June 2016 from: http://www.ibiblio.org/kuphaldt/socratic/sinst/output/INST231_sec1.pdf
2. Interview with Corey Marchand. October 30, 2015.

- **Community Colleges** can use work-based courses to meet the needs of employers while maximizing the value to students and maintaining their academic standards. Work-based courses also encourage students who might not otherwise consider community college to complete certificate and degree programs. Forty percent of students in OCTC's first three years of work-based courses reported that they planned to continue for a degree after these courses.

Lewis Nall, Program Coordinator for OCTC's Automotive and Diesel Program, explains that community colleges must continue to innovate in ways like this to be relevant in an evolving economy:

> Education today is changing. The students that we're getting are changing. They have to have a reason to be there. They're not going to come and get a degree just to have a degree. There has to be something at the end that they can see... We have to make sure that these students and that the industry realizes we have something very valuable to offer.

HOW ARE THEY DIFFERENT?

Work-based courses build on many strategies found in other forms of work-based learning and most closely resemble apprenticeships, particularly Registered Apprenticeships. Both allow students to learn in the workplace and rely on employers to actively participate in the students' education. Both pay students for their time at work. Both require on-the-job learning and related classroom instruction to form an in-depth technical education that builds both practical and theoretical knowledge. However, while on-the-job and related instruction are offered separately in apprenticeships, in work-based courses they are integrated. And unlike apprenticeships, which prepare students for a particular occupation, work-based courses grow out of the skills and competencies required within a technical degree or other defined academic course of study.

Cindy Fiorella, Vice President of Workforce and Economic Development at OCTC, describes that aspect of work-based courses:

> Our work-based courses are embedded within our industrial maintenance program. They may be embedded in our welding technology program. They may be embedded within our automotive technology program. They're traditional courses that have traditional competencies that, like all community college and technical college programs, have been vetted by industry advisory boards. They've been approved by faculty senates, and it's only the instructional modality that is really changing here.

Community colleges often award general academic credit for work-based learning such as experiential learning, internships, and apprenticeships. Work-based courses, in contrast, award academic credit for specific courses that are required for a degree: A student can take Fluid Power 100 in a classroom or as a work-based course and it will look the same on her transcript.

Another central difference between apprenticeships and work-based courses is that Registered Apprenticeships are prescriptive in order to ensure consistent, in-depth training pathways that are standard across an industry. Work-based courses prioritize flexibility over standardization. Apprenticeships are typically multiyear, with apprenticeships registered with the federal government requiring a minimum of 2,000 hours of on-the-job training and 144 hours of related instruction. In contrast, work-based courses are designed to be approximately one semester long. While employers can choose to stack work-based courses into a multiyear training, they are not required to do so. Employers can customize work-based course combinations for their workers, starting them at different skill levels or filling in different gaps in workers' technical knowledge.

This difference is reflected in the way that the work-based learning is recognized. Companies can register an apprenticeship program through a standardized and formal application process with the state or federal Office of Apprenticeship so that it leads to a national industry-recognized credential. With work-based courses, recognition varies, and community colleges, not companies, navigate and integrate the accreditation process. Students who complete these courses have an option of moving on to a certificate or college degree.

WHAT'S IN THE TOOLKIT

This toolkit provides guidance to community college administrators and faculty who are interested in bringing a work-based course model to their college. Tools and resources walk through the major stages of program design and implementation:

- **Section 1: Assessing Whether Work-Based Courses are Right for Your College** situates work-based courses in the broader context of work-based learning, degree programs, and career pathways to help determine if the model meets a need at your college. In addition, a self-assessment determines whether your college is ready to establish successful work-based courses.

- **Section 2: Building a Team and Institutional Support** guides the first steps of planning for the model with tools to design your work-based course team, build faculty support, partner with employers, and market the program to students.

- **Section 3: Designing the Course and Curriculum** focuses on how to translate an existing technical course into the work-based format, starting with choosing which courses to adapt through developing the course, competencies, and instructional design framework, and finally designing an assessment process. It also considers when to fill a cohort through a single company or employer consortium.

- **Section 4: Training Employer Supervisors and Mentors** helps faculty prepare employer supervisors for their critical role in course instruction. A facilitation guide for a training workshop includes planning tips, slides, handouts, and ideas for adapting the training format to meet employer needs.

- **Section 5: Delivering the Work-Based Course** supports work-based instruction with a variety of strategies for teaching in the workplace and insight into how these courses can look at a manufacturing plant.

- **Section 6: Connecting Workers to College** serves as a starting point for ensuring that work-based courses are an effective gateway to community college, highlighting the resources throughout the community college that can be used to enable the success of incumbent workers at school.

SECTION 1: ASSESSING WHETHER WORK-BASED COURSES ARE RIGHT FOR YOUR COLLEGE

ARE YOU EVER READY TO TOTALLY TRANSFORM THE WAY YOU DO BUSINESS?

–Cindy Fiorella, Owensboro Community and Technical College

Increasingly, community colleges are recognized for their flexibility in responding to the latest innovations within industry. Colleges change in part through the evolution of their existing educational models and content. But colleges can also change by adopting new programs and models that expand their offerings and tie learning more directly to industry needs and innovation. As a promising new model, work-based courses, build on other forms of work-based learning while formalizing the process for and recognition of instruction that occurs on the job. The design integrates instruction in the classroom and at work more seamlessly than other forms of work-based learning. Yet, developing and implementing work-based courses is a complex process that requires significant collaboration between community college and industry leaders.

Community colleges considering whether to adopt work-based courses should begin by determining whether this model adds value that serves its educational goals by preparing students for learning and for work. They should also consider whether work-based courses resonate with the needs they have heard from employers and with the roles their employer partners seek to play in the development of their talent pipeline. If a college does have a preliminary interest in work-based courses and a vision for how they can fit into the college's educational programs and pathways, it should assess whether it is institutionally ready to develop and implement the new model. This assessment is a critical first step in deciding whether to pursue the development of a work-based course program, and it should happen before any planning efforts to design and adopt the model.

THE ADDED VALUE OF WORK-BASED COURSES

Work-based courses build on several existing types of work-based learning, including internships, apprenticeships, and on-the-job training. Because they are actual college courses, work-based courses can play a unique role in a manufacturing program at a community college.

Owensboro Community and Technical College (OCTC), which has a long history of deep relationships with manufacturers in their region, decided to implement a work-based course model because it provides benefits to students, such as structured learning on the job, relatively early in their manufacturing education, not available through other forms of work-based learning. The college already partnered with employers to deliver work-based learning opportunities, but as OCTC President Scott Williams describes it, none delivered the same benefit of the worker's early exposure to the workplace:

> [A]pprenticeships and internships are quite effective, but they only really work at the tail end of the program where the person's got enough skill level to go in and address a need. So, from the standpoint of work-based learning, we think as an institution this [work-based course model] is really heading us in a good direction. The flexibility of allowing somebody to get on-the-job training and work, learn and immerse themselves with the industry sector that they have an interest in, and combine that with the educational training is the best of all worlds.

Work-based courses are valuable to employers as tools for developing incumbent workers and building a talent pipeline within the company. When OCTC convened regional manufacturers to gauge their interest in work-based courses, one employer identified the value of work-based courses by noting that the company currently had to hire from outside to fill its apprenticeship openings because their incumbent workers were unable to meet the entrance requirements. A rigorous but shorter-term program like work-based courses could elevate the skill level of their workers to take advantage of their apprenticeship program and provide a more direct recruitment path for the company.

Manufacturers partnering with OCTC also value the fact that recognized work-based courses go beyond other forms of work-based learning to incorporate their company training into an academic course structure. Tim Sheldon, Organizational Effectiveness Specialist, notes that

> the degree is a huge benefit to us at Kimberly-Clark and to . . . our employees. . . . The education paired up with the real job experience really fast-forwards people to be ready to work in a manufacturing environment, whereas just a normal person who did not have any degree or education [will] have to learn that through on-the-job training, which takes longer than what they could get with the classroom and the degree.

Finally, work-based courses enable employers to encourage workers to complete college. William Mounts, Vice President of OMICO Plastics, explains:

> It is very important to me to see that diploma, not only from the business side, but also see [workers] from the personal side [because] they could take that anywhere that they want to. If they decide that they're going to move to Boston or to New York, they have that opportunity, they have that diploma.

Colleges should consider how to integrate work-based courses into larger educational programs and career pathways in order to maximize their value for their programs, students, and employers. Are there critical points in a career pathway that would be best served by this model, perhaps overcoming existing barriers to advancement? Should individual work-based courses that are strategic priorities stand alone, or should work-based courses be combined and stacked as their own pathway? Answering these questions about where and how work-based courses fit in also provides early guidance about whether and how they should be adopted.

STRONG RELATIONSHIPS ARE AN ESSENTIAL STARTING POINT

OCTC attributes its success with work-based courses to the fact that the college already had strong supports within and among the key constituents of the model. OCTC President Scott Williams explains that there are

> three levels of communities that you've got to work with here. One of them is the student community and the parents of those students, or the adult learner. The second one is your internal community, your faculty and staff. And the third is...business and industry...Why we've been able to move in this direction fairly successfully and rather rapidly...is we have a tremendous ability to communicate amongst those different levels...We have very strong working relationships with the college and its academic programs and our workforce solution economic development arm of the college and business and industry sectors.

Without strong relationships with each of those "levels of community" already in place, it will be difficult to launch a work-based course program. Program administrators should evaluate whether they have the necessary internal and external supports to make work-based courses possible. College supports look different in different places, but flexibility—in designing and developing curricula, allocating funding and other forms—is an underlying attribute that can help launch a new model such as work-based courses, and program administrators should work to identify the points of flexibility in their institutions.

Strong relationships with manufacturing employers and others are also essential prerequisites for developing work-based courses. Given the central role of employers in work-based courses, this model will be extremely challenging to launch unless the college already has an understanding of the regional manufacturing economy and trusted, collaborative relationships with some of their local employers. Does yours? Community colleges with limited histories working with employers can begin with JFF's Employer Engagement Toolkit: From Placement to Partners or A Resource Guide to Engaging Employers for ideas on how to build more robust employer partnerships. Once the community college is comfortable working with and responding to employer needs, it can return to the question of whether to implement work-based courses.

A community college with strong institutional support, innovative faculty, and actively engaged employers can call upon each of those stakeholders to determine whether work-based courses add value to their manufacturing education and training efforts.

This section focuses on assessing whether work-based courses are a good choice for your institution. Tool 1-1 provides a framework to compare work-based courses to other models of work-based learning, and to select the model that meets current program needs. Tool 1-2 sets framing considerations for whether and how you would like to combine work-based courses; Tool 1-3 provides samples of how work-based courses can be embedded in a community college's career pathways, and Tool 1-4 provides an in-depth assessment of institutional readiness to develop work-based courses.

TOOL 1-1: SELECTING AN APPROACH TO WORK-BASED LEARNING

Type of Tool: Worksheet

Summary: This worksheet is the first step in deciding whether and how to add work-based learning to your program. While you should also consider what work-based learning opportunities your program and college already provide, this tool focuses only on the attributes of the new opportunities that interest you. First, it makes the needs and goals of each stakeholder—the college, the employer, and the student—explicit. Second, it allows you to compare your responses to an overview table of work-based courses and several other common models of work-based learning. You can use this exercise as a way to identify the model or models that could best enrich your program.

Why: There are many different work-based learning models, and it is best to understand the merits and requirements of each before committing to one. These considerations guide a selection that makes the most sense for your college, students, and employer partners. Many colleges pursue multiple work-based learning strategies that complement each other at different stages of a student's education or that connect with formal education pathways in different ways. Regardless of how many models you choose, each approach will have more buy-in and foster educational and career success if it is driven by the needs shared by employers, students, and colleges.

Who Should Use this Tool: Program administrators

Spotlight on OCTC: Owensboro Community and Technical College had employed a variety of work-based learning approaches in multiple departments before considering introducing a new model to their manufacturing program.

> "Work-based learning is when a college works hand-in-glove with an employer partner to accelerate the pace of learning by...not only reinforc[ing concepts] at the workplace from the classroom instruction, but also... captur[ing] the instruction that takes place day to day in any type of production process."

Cindy Fiorella, Vice President of Workforce Solutions at the college, notes that compared with other forms of work-based learning, what is

> "unique about the work-based [course] model is we've said, 'Okay, this is what we would traditionally have in a course. It aligns with what the industry is wanting as far as skills. Check those off the list to assign credits."

STEP ONE

Ask yourself what you are looking for by adding work-based learning to your academic courses or technical training. Remember that you may choose different approaches for different pieces of a manufacturing program, so focus on your needs for a single course or a single target population.

I am exploring work-based learning as a strategy within our manufacturing program to (i.e., enrich existing courses, expand our curriculum, serve incumbent workers, better meet the needs of area employers):

_____

_____

_____

The community college would like to (check all that apply):		
____ Add work-based learning to an existing course	____ Create a new course with work-based learning	
____ Lead educational design and delivery	____ Support the efforts of an employer	
Identify work-based learning opportunities that are:	____ Short-term	____ Long-term
Offer industry-recognized credentials to our students:	____ Yes	____ No

Our employer partners (check all that apply):		
____ Have not yet been identified	____ Are identified but not actively engaged	____ Are highly committed
Have expressed interest in: ____ Helping design training	____ Providing training	____ Investing directly in workers
Have turned down training opportunities before because of internal issues such as training budget cuts, scheduling conflicts, time required away from the job, etc.:	____ Yes	____ No

Our potential work-based learning students:		
Are working toward an A.A. or A.A.S degree:	____ Yes	____ No
Include incumbent workers:	____ Yes	____ No
Need to earn income while enrolled in education and training:	____ Yes	____ No

STEP TWO

Compare your responses to the table that follows, summarizing different common work-based learning models and see which options meet your needs. The work-based learning models described are:

- **Problem-based learning:** Classroom teaching approach that emphasizes practical and hands-on experiences that mimic the workplace
- **Job Shadowing and On-Site Tour:** As part of a course, employer hosts students to observe workplace and/or employees in relevant occupations
- **Internship:** Student supplements academic coursework for a bounded period of paid or unpaid real work experience that includes guided learning opportunities provided by employer
- **Work-based courses:** Academic courses are designed, taught, and assessed in a way that integrates real job responsibilities throughout
- **On-the-Job Training:** Employer provides formalized training on the job site that is needed for specific occupations
- **Apprenticeship:** Combination of formalized work-based learning and classroom learning to develop highly skilled workers

For more information about these models, see JFF's publications, "Making Work-Based Learning Work" and "Work-Based Learning in Action," a series of case studies at jff.org/publications.

The model that best meets our current needs is:_____

This is only a first step in a larger process to select, design, and implement a work-based learning model. Other factors influencing appropriateness and feasibility, such as resources, will need to be examined throughout the decision-making process.

Summary of Work-based Learning Models

	Problem-Based Learning	Job Shadowing or On-site Tour	Internship (co-op, paid, unpaid)	Work-Based Courses	On-the-Job Training	Apprentice-ship
Degree Learning Integrates work	Simulated	Observe but not doing	Related, not always closely	Highly intentional	Basis of delivery	Basis of delivery
Involvement of College	Activities are housed in classroom	Embedded in college course	Comple-ments college activity	Organized through college	Not necessarily involved	Can partner for credit or classroom component, not main provider
Involvement of Employer	None, but may provide ideas	Host short-term activities	Sponsor and supervise	Lead much of delivery, working with faculty	Design and deliver	Design and deliver
Credentialing	Supports college credit	Can support college credit	Can support college credit	College credit	None, unless choose to include industry-recognized credential	Registered appren-ticeship is naturally recognized and can design for college credit
Earn While You Learn	No	No	Sometimes paid	Yes	Yes	Yes
Duration	Short-term	Short-term	Limited duration, full- or part-time	Semester-based	Ranges (usually 4-20 weeks)	Up to several years
Internal Issues for Employers	None	Limited	Depends on who pays intern	Determined by college, goal is to minimize employer process	Public system has high demand process	Process for both registration and delivery

STEP THREE

Start planning your activities. This toolkit can help you with the planning and implementation of work-based courses.

TOOL 1-2: WORK-BASED COURSES AS BUILDING BLOCKS

Type of Tool: Worksheet

Summary: A work-based course is not a program, but rather a specific delivery format for course content that can be built into any variety of program structures. An individual work-based course functions as a block that can be stacked with other work-based courses or traditional courses to build a program. This tool offers guiding questions to help community colleges set initial expectations for using work-based courses as building blocks. Considerations about college and employer goals, instructional opportunities and constraints, and resources can help program administrators decide whether to:

- Offer targeted, individual work-based courses that do not combine into a work-based pathway
- Launch individual work-based courses with the goal of building out to a work-based certificate or degree program after the model is tested and proven
- Create a work-based course pathway that spans a full certificate or degree program

Why: The structure of how work-based courses fit together does not have to be fixed from the outset. Community colleges can move from offering targeted courses to a full certificate or degree, or they can narrow the focus to a few in-demand work-based courses after first offering a broader range of courses. However, your initial expectations for how to use work-based courses as building blocks could have implications for course selection and program design. For example, colleges that expect to offer only select work-based courses might focus on advanced, high-demand courses that can lead to career advancement with little or no additional education. Colleges aiming to stack the courses to a full degree might begin by adapting introductory level courses and then, as students progress, redesign increasingly advanced courses.

Who Should Use this Tool: Program administrators, faculty

Spotlight on OCTC: When OCTC began planning the introduction of work-based courses in their Advanced Manufacturing Technologies program, leadership in the Workforce Solutions division hoped that the approach could change how they worked with employers to design incumbent worker training. Before talking to employers, OCTC expected to launch with introductory technical courses that could lead to multiple certificates or degrees. Instead, employers requested that OCTC first adapt higher-level work-based courses, in part out of concern that introductory-level learning could be a risk to their equipment and disrupt their production process. After proving their value by implementing about a dozen work-based courses across numerous companies, OCTC has been able to combine introductory and advanced work-based courses as the core of a work-based Advanced Manufacturing Technician associates degree. This is one of many ways that work-based courses are now integrated into the partnerships that OCTC builds with manufacturers.

WORK-BASED COURSES: INDIVIDUAL BLOCKS OR STACKED PATHWAY?

Ten questions about the goals and resources of your college and employer partners can help frame your thought process about whether to adapt a few targeted work-based courses within a traditional program, or to redesign an entire work-based pathway.

Select the appropriate answer for each question, and then discuss your answers in more detail with your planning team. If the majority of responses line up with one column, you might consider that approach in more depth. You can also use the explanation column to note if some considerations are a higher priority in your decisions about how to use work-based courses as program building blocks.

	Targeted Courses		Work-Based Pathway	Explain
Is your primary goal to create new...	entry points to certificate and degree programs	- OR -	formats for earning that degree?	
Do working students have high attrition rates?	No	- OR -	Yes	
Do you have sufficient resources to redesign...	only a few select courses	- OR -	a wide range of courses?	
Is there broad faculty interest and ability in teaching courses this way?	No	- OR -	Yes	
Do employers have a need primarily to...	fill immediate talent gaps	- OR -	create new pathways for advance-ment?	
Are employers in the region expressing a need for...	training for targeted in-demand skills	- OR -	intensively skilling up its workforce?	
Do employers provide resources (i.e., tuition reimbursement, flexible scheduling) for employees to enroll in college?	Yes	- OR -	No	
Do employers currently have uptake on resources for college enrollment?	Yes	- OR -	No	
When selecting courses to redesign, do employers...	coalesce around a few courses	- OR -	request a wide range of courses?	
Are employers comfortable with workers learning and practicing course content on the job...	only after demonstrating some technical proficiency	- OR -	for technical courses of all levels?	

TOOL 1-3: CAREER PATHWAYS

Type of Tool: Sample pathways

Summary: This tool provides examples of how work-based courses can fit into manufacturing career pathways developed by community colleges. The first career pathway illustrates how select work-based courses can be strategically placed within key points of a career pathway to advance workers. Students and workers progress through the bulk of the pathway using existing workforce development opportunities such as academic courses, the attainment of industry recognized credentials, or on-the-job training from their employer. In the second example, work-based courses are at the center of each step of the career pathway. These courses may not be appropriate for every component of the pathway, but traditional education and training is used to supplement the work-based courses, rather than the other way around.

Why: Work-based courses will be more valuable if they have an intentional connection to a broader strategy to advance the students who enroll in them, and career pathways provide such a structure. Career pathways sequence education and training opportunities across educational and workforce systems to facilitate the advancement and long-term success of low-skilled workers. National policymakers, community college leaders, and other educators increasingly recognize the value of career pathways in helping underserved individuals access high-quality jobs in skilled, high-demand occupations and industries. Pathways are most successful when they provide multiple entry and exit points, as well as multiple ways to obtain the skills and credentials needed at any given point within the path. Work-based courses can serve as an entrance point to a career pathway by reconnecting workers to postsecondary education. They also serve as a new format to provide the education and training needed to move individuals along the pathway toward career success.

Who Should Use this Tool: Program administrators, faculty

Spotlight on OCTC: The sample career pathways provided in these tools are adapted from existing career pathways and work-based courses currently offered at OCTC.

TARGETED WORK-BASED COURSES WITHIN A TRADITIONAL DEGREE PROGRAM

OCTC's AAS Degree in Technical Studies consists of several stackable certificates, so that a student can earn recognition for their course completion along the way to a degree. OCTC has combined the three work-based courses most popular with employers, Fluid Power, Electrical Principles, and Maintaining Industrial Equipment I, into an Industrial Maintenance Mechanic Level 1 Certificate that also serves as the foundation for this career pathway.

After earning this work-based certificate, or completing a subset of these foundational courses, students are positioned to pursue their choice of more advanced certificates through traditional courses. Employers may also choose to offer additional select courses in a work-based format as students work toward a degree. OCTC has adapted a wide range of these industrial maintenance technician courses to a work-based format so that they can be combined with traditional courses based on employer interest.

OCTC'S AAS DEGREE

General Occupational Technical Studies

Industrial Maintenance Technician Diploma (49-53 credits)

Class Name	Course Number	Credits
General Education and distribution requirements	-	9 Credits
Motor Controls or Rotating Machinery Course	IMT 220/221, EET 270/271, ELT 244, IMT 120/121, or EET 264/265	-
Industrial Maintenance Technology Capstone	IMT 289	1 credit

Plus (from below) - Basic Blueprint Reading; Basic Welding B; Fundamentals or Machine Tools A and B; **Maintaining Industrial Equipment I; Fluid Power; and Electrical Principles**

Industrial Maintenance Technician Diploma (19-21 credits)

Class Name	Course Number	Credits
Basic Blueprint Reading	BRX 120	3 credits
Basic Welding B	WLD 152	5 credits
Fundamentals or Machine Tools A and B	CMM 110/112	7 credits

Plus (from below) - **Maintaining Industrial Equipment**

Industrial Maintenance Mechanic Level II Certificate (22-26 credits)

Class Name	Course Number	Credits
Basic Blueprint Reading	BRX 120	3 credits
Basic Welding B	WLD 152	5 credits
Fundamentals or Machine Tools A and B	CMM 110/112	7 credits

Plus (from below) - **Fluid Power and Electrical Principles**

Industrial Maintenance Mechanic Level I Certificate (15 credits)

Class Name	Course Number	Credits
Fluid Power	FPX 100/101	5 Credits
Electrical Principles	IMT 110/111	5 Credits
Maintaining Industrial Equipment I	IMT 150/151	5 Credits

Owensboro Community & Technical College
HIGHER EDUCATION BEGINS HERE

WORK-BASED DEGREE

OCTC has stacked manufacturing work-based courses into a work-based Industrial Maintenance Technology–Advanced Manufacturing Technician Associate's degree. Students begin taking work-based courses at the beginning of the degree program for 100-level courses and continue to enroll in work-based courses through their 200-level technical requirements. All courses are work-based except for the general education distributional requirements.

This work-based degree is made possible through Greater Owensboro's chapter of the Kentucky Federation for Advanced Manufacturing Education (GO FAME), in which local employers commit to hiring jobseekers who simultaneously enroll in OCTC. The students work for the manufacturer three days a week and complete the classroom and lab components of their courses two days a week. The employer co-delivers work-based courses for 18 months, and has the option to hire the student as a permanent employee upon graduation .

Associate's Degree: Advanced Manufacturing Technician (74 Credits)

Semester 5 - Class Name	Course Number	Credits
Industrial Robotics and Robotic Maintenance	IMT 200	4 credits
Practicum Troubleshooting	IMT 198	2 credits
Industrial Maintenance Technical Capstone	IMT 289	1 credit
Maintenance Reliability	IET 1305	1 credit
General Education Courses	-	6 credits

Semester 4 - Class Name	Course Number	Credits
Programmable Logic Controllers I	EET 276	2 credits
Programmable Logic Controllers I Lab	EET 277	2 credits
Electrical Motor Controls II	EET 272	2 credits
Electrical Motor Controls II Lab	IEET 273	2 credits
Problem Solving	IET 1304	1 credit
Fundamentals of Machine Tool B with Lab	CMM 112	4 credits
General Education Course	-	3 credits

Table continues on next page.

Semester 3 - Class Name	Course Number	Credits
Fundamentals of Machine Tool A with Lab	CMM 110	3 credits
Welding for Maintenance	IMT 100	3 credits
Welding for Maintenance Lab	IMT 110	2 credits
Total Production System Management	IET 1303	1 credit
Basic Blueprint Reading	BRX 110	2 credits

Semester 2 - Class Name	Course Number	Credits
Maintaining Industrial Equipment	IMT 150	3 credits
Maintaining Industrial Equipment Lab	IMT 151	2 credits
Electrical Motor Controls I	EET 270	2 credits
Electrical Motor Controls I Lab	EET 271	2 credits
5S	IET 1302	1 credit
General Education Courses	-	6 credits

Semester 1 - Class Name	Course Number	Credits
Industrial Maintenance Electrical Principles	IMT 110	3 credits
Industrial Maintenance Electrical Principles Lab	IMT 111	2 credits
Fluid Power	FPX 100,	3 credits
Fluid Power Lab	FPX 101	2 credits
Safety Culture	IET 1301	1 credit
General Education Courses	-	6 credits

TOOL 1-4: ASSESSING INSTITUTIONAL READINESS

Type of Tool: Institutional assessment

Summary: This tool is designed to gauge institutional readiness for implementing a work-based course model. Readiness measures include employer relations, college leadership and buy-in, curricular and program design flexibility, and financial feasibility.

Why: Work-based courses require a specific set of conditions in order to succeed. This assessment allows colleges to evaluate their current capabilities, identify gaps, and map out additional capacity needs before undertaking full program design work. This tool is designed to aid in that process, and provide a framework for colleges to discuss internally and with their partners ways to achieve optimal conditions.

Who Should Use this Tool: College teams comprised of administration, manufacturing CTE faculty, and employer advisory board members

Spotlight on OCTC: OCTC has been a regional leader in employer engagement, customized training, and workforce education for over a decade. These strengths have been developed largely because of their collegewide appreciation for teamwork and collaboration. Lewis Nall, an faculty member at OCTC credits the institution for his success with work-based courses:

> Having the support of my administration, having the support of my president and my vice presidents and those that are there is imperative to making this work, because it requires me to work extra sometimes. It requires...a lot of trust...that I'm keeping up with the students, and that I'm making sure that they really are getting the education that...they came here for. I have to have their support for the time I'm not in my office.

OCTC also recognized the opportunity to develop a new approach based on enthusiasm for collaboration at the college and among employers. In the words of Scott Williams, President and CEO of OCTC:

> In my 15 years here, this has been...a time when I've never seen business and industry and higher [education] come closer together and have earnest discussions on how we can help one another and how we can be of benefit.

ASSESSING INSTITUTIONAL READINESS

Successful implementation of work-based courses requires a particular set of conditions, partnerships, and institutional nimbleness. Planning these conditions and partnerships is essential. In order to get a full picture of readiness and to determine the areas that may need additional capacity before implementation, colleges should undertake a survey of key areas.

Successive tools delve deeper into faculty involvement and assembling your implementation team. This tool takes a broader, institution-wide look at readiness and feasibility. These questions are meant to prompt a conversation for a work-based design, and should not be seen as an exhaustive list of considerations. Rather, use these to take an overall snapshot of institutional considerations and capacity.

Some areas of readiness are essential. Specifically, having strong employer or industry relationships and program design/curricular flexibility. Without these pieces in hand, a work-based course model is not feasible, as it rests completely on these two conditional foundations.

Readiness Measures

Colleges must have full buy-in and support from college leadership.

Work-based course designs require a large degree of institutional flexibility, and support from college leadership can help ensure that implementation will not be met with difficult internal barriers.

Colleges should have strong, mature employer and industry relationships.

As work-based courses are designed to serve the needs of both students and industry, it is essential that colleges have fully developed, secure employer relationships in place. These relationships must go beyond standard advisory committees and must represent a shared vision and goal-setting process. This will allow colleges to determine if employers have potential for strong interest in work-based courses.

Colleges should have institutional flexibility for program and curricular design and delivery.

Work-based courses require that an institution has the flexibility to adapt existing credit-bearing courses for delivery in both a classroom and a work setting. For many colleges, a state or district-wide system has authority over curricular variability, so colleges must determine if and how they can adapt existing courses. For colleges that have greater individual control over programming, it is still important to determine the particular process for curricula and programmatic revision.

Colleges should work to identify funding sources beyond employer or student-worker contributions.

Work-based courses, like any newly implemented program, can have significant startup costs. Colleges should identify early potential funding streams that could contribute to extra staff time, planning costs, as well as augmented instructional considerations.

Colleges should be able to demonstrate strong regional need to invest in skills training for the manufacturing industry.

The work-based course model is a strategy that involves a fair amount of investment from all partners, and requires a strong, steady commitment from area employers. Colleges should determine, through the use of labor market information tools, interviews with local industry, or other intelligence-gathering strategies, that a region can support a stream of trained candidates for both short and long term.

Institutional Measure	Questions	Notes	Readiness Scale		
			Not Present	Emerging	Established
Leadership Support	**Is college leadership on board?**				
	Is upper administration aware of and signed on for a work-based course program?				
	What factors indicate sufficient support? Explain.				
	Does college leadership participate in planning, outreach, community relations?				
	Are there significant contributions from leadership on committees or workgroups?				
	Identify additional resources or capacity gaps.				

Table continues on next page.

Institutional Measure	Questions	Notes	Readiness Scale		
			Not Present	Emerging	Established
Employer Relations	**Is industry engaged and on board for a co-delivered model?**				
	Do industry representatives sit on advisory committees?				
	Are industry or company representatives currently involved in curricular design?				
	Is industry involved in placement strategies for students via internships, jobs, etc.?				
	Does your college or department currently develop customized training for employers? Could these relationships be leveraged?				
	Are employers well positioned to support a co-delivered model?				
	Identify additional resources, relationships, or opportunities needed.				

Table continues on next page.

Institutional Measure	Questions	Notes	Readiness Scale		
			Not Present	Emerging	Established
Program Development Flexibility	**How much local institutional variation is allowed for curricular design? Is this sufficient to accommodate a work-based course design?**				
	Where is the program going to be principally housed (Continuing Education/ Workforce or Credit departments)?				
	If housed in continuing education or workforce departments, are articulation agreements in place for college credit?				
	Identify additional internal resources could be leveraged to strengthen program design capacity.				
Instructional Flexibility	**How comfortable are faculty with new instructional models?**				
	Do current faculty have experience delivering on-the-job training, other work-based learning, or apprenticeship models?				
	How connected to industry are current faculty?				
	Identify internal training or professional development opportunities are in place now that could be leveraged.				

Table continues on next page.

Institutional Measure	Questions	Notes	Readiness Scale		
			Not Present	Emerging	Established
Funding source identification	**What funding streams are available for a work-based course model to cover costs such as tuition support, training wages, and on-the-job training delivery? (Potential sources include employers, workforce boards, state training funds, and foundations.)**				
	Does the college have robust relationships with local workforce boards or other state training dollars?				
Strong demonstrated need in manufacturing industry	**What sources for skills gap or industry training needs have been consulted?**				
	Labor market information verification				
	Other employer feedback and input				
	Longer-term projections				

SECTION 2: BUILDING A TEAM AND INSTITUTIONAL

SUPPORT

EVERYBODY'S GOT TO BE PART OF THIS. IT'S A TEAM. WITHOUT A TEAM, WE COULDN'T DO THIS.

–Cindy Fiorella, Owensboro Community and Technical College

Work-based courses present an opportunity for community colleges to build on their ability to connect learning and work. They also present a challenge because they are a departure from a college's usual way of doing business. Work-based courses require faculty members to trust industry partners to help develop instruction and assessment and asks supervisors to facilitate learning opportunities as part of meeting production demand. The work-based course model is complex and rigorous and requires that everyone assume roles that are likely to be different than their current ones. This means that putting work-based courses in place is not easy and requires a lot of work and commitment from a variety of people across multiple organizations. Section Two helps colleges consider what needs to be in place before scheduling the first meeting to start designing a work-based course. By securing institutional support and building a robust work-based course team, colleges can launch work-based course programs in a way that will not only set them up for initial success, but also respond to any challenges that emerge in later stages of implementation.

BUILDING A ROBUST CORE TEAM

Even the most entrepreneurial and dedicated college administrator or faculty member cannot implement work-based courses in isolation. Multiple stakeholders are involved in developing work-based courses, and it is critical that they all believe in the value of work-based courses and work together as a team. Developing work-based courses requires each stakeholder to broaden their usual way of doing business: Colleges and college systems must approve these courses for their credit standards. Multiple faculty members need to buy into the model, because within a department, different faculty members will be instructors for each work-based course. Manufacturers must not only define their training needs, but also provide course instruction as part of their jobs.

Establishing buy-in and ownership from the administration will pave the way for faculty and employers to promote the new type of course and will also improve the quality of the design and implementation of the work-based courses themselves. As Dean Autry describes initiating his process of introducing work-based courses to OCTC,

> the biggest concern was just getting everybody on board, the manufacturer, the faculty at the college. I already had the support of the administration and the support people, so that was okay. But I had to get my faculty involved and also the manufacturers.

Building a core team is an essential first step in early efforts to launch a work-based course program. The team should reflect each of the different stakeholders involved in the model delivery and be designed to take advantage of the institutional assets of a community college, the teaching innovations of faculty members, and the on-the-ground expertise of manufacturers throughout the design process. The college should seek to identify support, such as course-release or faculty stipends, to ensure that team members have time to dedicate to an involved and iterative design process. As Autry points out about his team in starting up this model,

> you've got to put the work in, and you have to have dedicated people from the faculty, from the industry, from the workforce development to support staff. Everybody's got to be a part of this. It's a team. Without a team, we couldn't do this. But be understanding. It takes some time. It's not just something that's going to happen overnight.

The core team will serve as both experts and champions for the model. In partnership with the team, program administrators can continue to build support for work-based courses across the college, with additional faculty members and among other regional manufacturers. This team will also identify who needs to be involved in each stage of outreach, course design, and implementation so that partners can contribute where they are the most valuable.

MOVING FORWARD TOGETHER

Community college champions of work-based courses need to be deliberate about how they frame their initial messaging about the model to other work-based course team members and partners. College leadership and faculty, manufacturers, and potential students each use different language, have different goals and needs, and will have a different role in the delivery of work-based courses. At the same time, these partners need to share a consistent definition of the core model so that everyone is on the same page about what they expect a work-based course to look like and how it will be delivered. The team design and delivery that are central to the model require that partners regularly come together and agree on the specifics of each work-based course, including how they will each contribute to its success. In addition, work-based course champions should clearly convey the model's unique value proposition to each stakeholder.

This section provides tools to guide this stage of institutional preparation, from designing a work-based course team to maximizing broader faculty involvement and recruiting employers for an active implementation role. The section also includes marketing material to effectively communicate and promote the value of work-based courses to each of the stakeholders: faculty, employers, and students.

TOOL 2-1: DESIGNING YOUR WORK-BASED COURSE TEAM

Type of Tool: Worksheet

Summary: This tool is intended to aid colleges in assembling a strong design and implementation team. It provides framing, probing questions, and responsibility overviews to ensure that the work-based course team brings industry experience, employer relationships, upper level administration support, project management, and curricular design.

Why: Work-based courses are a big undertaking for colleges and local industry, and they require all involved to take on new roles and responsibilities. Assembling a strong team at the beginning of the planning process will allow a college to draw on the knowledge and experience of a core group as it shapes its work-based course program.

Who Should Use this Tool: College administrators

Spotlight on OCTC: OCTC's work-based course team consisted of vice presidents, directors of workforce education and manufacturing training, as well as faculty, support staff, and others. The variety of team members allowed OCTC to build a work-based course model that was not only sound but also strongly supported by college leadership. Dean Autry, Associate Dean of Advanced Manufacturing Technology Programs at OCTC, reflects on their experiences developing work-based courses:

> "What you need to have for a good team, you need to have a president that supports you; the academic dean or vice president or whoever they are needs to support the program. You also need to have support people. You cannot do this with just faculty. You have to have people who are willing to help you do paperwork. It might be anything from filling out tasks or helping you to work on your task reports for the company or for your college and do all the paperwork for you."

DESIGNING YOUR WORK-BASED COURSE TEAM

Putting together a strong team is crucial to designing a work-based course program. Further, intentionally planning roles and responsibilities, tasks, and coordination early in the design phase will enable you to appreciate the full scope of the work involved and to determine your institution's capacity to carry out the project.

Work-based courses require institutional staff to expand their current roles, and may even require capacity-building and professional development activities as the program evolves.

Below are some tasks and roles common to work-based course programs. Use these categories to identify either existing staff or partners who can perform these duties, or to plan for new staff development or hiring.

Duties and skills necessary for work-based courses:

- **Industry experience, knowledge, and connections:** Your team should include staff or instructors who have in-depth knowledge of the industry, its needs, and conditions. Often, faculty are themselves transplants from area companies, or had extensive production experience earlier in their careers. Use this knowledge, and potential connections, to help guide the development of programming.
- **Employer relationships and community engagement:** A crucial element of work-based courses is employer relationships. Your team should include those who possess and nurture deep relations with industry and area employers. Wherever possible, leverage employers themselves to sit on planning committees, act as high-level advisors for design efforts, and serve as champions to other employers.
- **Upper level administration support:** College leadership or upper level administration support is vital to a work-based course program. Support from the administration can ensure that your team has a champion both internally at the college and externally in the community. Additionally, leveraging college leadership early in your team development process can strengthen the likelihood that your program will be sustainable amidst shifting institutional priorities.
- **Project management:** Project management, coordination, and oversight are vital at the outset of work-based course implementation. While this need may lessen to some degree as the program becomes more entrenched in the general college, it is essential that some party or parties have the task of organizing, convening partners, and managing staff.
- **Curricular design:** As with any community college course, work-based courses require an instructional design process that upholds the rigorous standards of the college and program. Faculty with instructional design experience, program designers with experience in implementing team teaching, and industry training representatives who can help incorporate employer needs in the curricular design can all strengthen the team's curricular approach.

IDENTIFYING TEAM MEMBERS

Industry Knowledge and Experience	Potential Staff or Partners
• Understand manufacturing industry and the work of manufacturing in the area; advise on all project aspects ongoing • Provide experience in supervisory, training, and other industry functions	• Source Example: Technical instructors or other faculty • Name:_____ • Name:_____

Project Management and Coordination	Potential Staff or Partners
• Provide overall project coordination and management • Build internal and external partnerships, including employer relationships and work-based course sites, and internal faculty relations • Develop processes for students with institutional departments: financial aid, registrar, admissions • Develop an evaluation plan for tracking student and program outcomes • Develop materials to communicate with internal and external constituents	• Source Example: Deans of CTE, workforce coordinators • Name:_____ • Name:_____

Administration Support	Potential Staff or Partners
• Work with registrar, financial aid, admissions to help students navigate the systems • Coordinate facilities and scheduling supervisor/employer collaboration • Track student and program data • Manage paperwork • Schedule meetings, both internally and externally	• Source Example: Administrative assistant, project associate • Name:_____ • Name:_____

Table continues on next page.

Student Services and Coordination	Potential Staff or Partners
• Recruit students • Coordinate student intake and assessments, including prior learning and entry requirements • Lead student orientation • Connect students to broader college opportunities, navigate landscape	• Source Example: College navigator, student support counselor, transitions advisor • Name:_____ • Name:_____

Curricular and Program Design	Potential Staff or Partners
• Advise faculty and employers through job task analysis and revised course delivery format • Translate existing courses to on-the-job delivery format • Create assessment policies, procedures, and instruments with faculty and employer buy-in • Advise on project throughout	• Source Example: Faculty, industry representative, college instructional design team • Name:_____ • Name:_____

Employer Relations and Community Engagement	Potential Staff or Partners
• Coordinate relationships with area employers, industry insiders, and industry associations • Communicate program goals to a wider audience, including press, community leaders, and upper level college administrators	• Source Example: Project coordinators, workforce coordinators, customized training associates • Name:_____ • Name:_____

TOOL 2-2: CULTIVATING FACULTY INVOLVEMENT

Type of Tool: Interview template and worksheet

Summary: This tool consists of a set of information-gathering instruments that identify faculty experience, gauge interest and ability, and guide the assembly of faculty teams. These tools are designed to solicit these faculty experiences so that the design of work-based courses is grounded in both instruction and manufacturing contexts.

Why: Work-based courses require strong faculty involvement, and leveraging their knowledge and expertise early can help shape the program and ensure buy-in. Often, faculty members have extensive history working in industry as well as in the classroom, and this combined knowledge is the foundation for work-based courses.

Who Should Use this Tool: Administrators, division heads, or deans

Spotlight on OCTC: Leon Mills, Electrical Maintenance Training Coordinator for Business and Industry, Workforce Solutions, at OCTC, reflects on how his manufacturing experience has informed his teaching practice:

> I was really fortunate that I was able to work in a plant environment before I got into training. So that helped me to understand what a person would need to know to be a good electrician out on the floor. So I tailored all of my classes and my labs around that, from the experience I got in the plant.

IDENTIFYING FACULTY EXPERTISE

At the beginning of every new college project or initiative, it is common to assess institutional conditions through an internal and external asset mapping process to determine the strengths and areas of growth needed for project success. What is sometimes deemphasized in this process, however, is a thorough, inward-facing analysis of faculty experience and expertise. For most career and technical education programs, and in Manufacturing and Advanced Manufacturing in particular, leveraging this faculty experience is a crucial component in program success and longevity. When faculty are engaged, consulted, and encouraged to work collaboratively, work-based courses have a greater chance of keeping a foothold in institutional practice.

In order to cultivate involvement, it is important to start by gathering information on the experience and perspectives of faculty. Many faculty bring valuable experience in on-the-job-training, or knowledge of particular company practices. This information will allow a college to identify faculty who could help shape the program, map experience and interest, and form teams to implement designs.

Below are some questions designed to explore faculty interest, knowledge, and experience in work-based learning. These questions can be delivered both individually and in small groups.

Faculty Interview Questions

1. Describe your background in the manufacturing industry prior to joining the college.

2. How does your past experience in the industry influence your teaching style?

3. What roles or tasks did you have in industry that you feel prepared you most for teaching career and technical education?

4. Describe your involvement, either as a student, supervisor, or instructor, in work-based learning opportunities throughout your career (e.g., co-ops, internships, on-the-job training, others). What are some similarities and differences you see up front between some of your past work-based learning experiences and the work-based course program your college is implementing?

5. How do you feel about work-based learning in the manufacturing industry? How do you feel about the college taking on this educational model?

6. What are some initial recommendations you have about designing a work-based course program at your college?

7. In what ways do you feel you could contribute best to the work-based course team? (Outline potential roles, such as conducting a job task analysis with employers, developing or reviewing course materials, or training employer supervisors for their role as instructors.)

MAPPING FACULTY EXPERTISE

Use the following checklist to map out faculty's existing experience in industry roles. These roles (and others you might discover during interviews) signify valuable expertise that you can leverage when designing a work-based course program and assembling faculty teams.

Faculty Name	Work-based learning instructor	Supervisor	Company Trainer	Quality control or improvement	Others?
Cheryl Smith, Mechanical Maintenance	*Yes - Apprenticeship Instructor 3 years*	*Yes - 15 years at Makery Corp*	*Yes - ran Training Dept for 3 years*	*No*	

CREATING FACULTY TEAMS AND COMMITTEES

Faculty are valuable assets in a work-based course program, and it is important that their knowledge and experience are used to inform the project throughout its existence. However, existing faculty and college staff also have limited capacity for new projects, and so teams or committees should be created to carry out the work of advising and shaping the program development. Creating faculty teams and working groups will allow for maximum faculty input while spreading the responsibility and workload across multiple partners; it will also ensure that the program has buy-in with faculty who are not necessarily engaged in the work-based course instruction.

Below are some team functions. Use these and others that you identify to slot in faculty with valuable information and experience.

Guide to Involvement/Time Commitment:

- Light—sporadic, less than 10 total days
- Moderate—ongoing throughout the project, 5-15 percent of workload
- Heavy—ongoing throughout the project and/or intense periods of activity, at least 25 percent of workload

Program Design and Curricular Planning

- Involvement/Time Commitment: Heavy to Moderate
- Members include faculty who have developed courses, worked as industry trainers, or others with applicable experience
- Types of activities may include planning, curricular revisions and writing, and facilitation of the job task analyses

Work-Based Course Instruction

- Involvement/Time Commitment: Heavy
- Members include faculty who have a proven track record in instruction, collaboration, and industry-verified knowledge
- Types of activities may include instruction in the classroom or coordination and instructional coaching of employer supervisor

Employer/Industry Relations

- Involvement/Time Commitment: Moderate to Light
- Members include recent industry transplants or faculty with particularly recent industry connections, or those who have an active role in the manufacturing community
- Types of activities may include managing external relationships and connecting college personnel with industry and employers

Work-Based Course Evaluation

- Involvement/Time Commitment: Light
- Members can include faculty and institutional research staff with particular knowledge and interest in quality control, human resource history, or management experience
- Types of activities may include determination of evaluation metrics, measures, and methods, occasional support of assessment implementation

TOOL 2-3: PARTNERING WITH EMPLOYERS

Type of Tool: Worksheet

Summary: This tool helps program administrators and industry liaisons at several initial stages of employer partnership. First, it provides considerations to identify promising companies for work-based courses, whether existing college partners or new companies to recruit. Second, it frames several benefits of bringing together employers who offer work-based courses. Third, the tool provides an overview of potential work-based course roles throughout course design and delivery for various staff within a company.

Why: Given their central role in the delivery of work-based courses, employers need to be involved at the very start of program design. Early involvement allows employers to share ownership of the program and best prepare for their later roles. Companies that know who needs to be involved in program design and delivery, and in what capacities, will be better partners throughout work-based course implementation. In addition, securing an employer champion is useful for recruiting other employers for the program.

Who Should Use this Tool: Program lead, industry liaisons

Spotlight on OCTC: OCTC entered the development of its work-based courses with a number of deep employer relationships across the manufacturing industry. The program was launched from its Workforce Solutions division, a community college leader in business services and training that had programs already provided a variety of workplace learning programs for manufacturers, hospitals, and other regional employers. The work-based course champions within the college knew that industry participation was central to the model, so they began their efforts with outreach to regional manufacturers that were existing partners. The college engaged companies to identify their interests and needs that could shape course selection and design when marketing work-based learning.

Securing initial employer champions was the most difficult part of engaging industry, but the track record and trust that OCTC had already built with businesses was extremely valuable in attracting initial manufacturers that would serve as industry champions. Donald Woolridge, Human Resources Manager for Aleris Corporation, echoed the sentiments of several industry executives when he explained that the company already had

> an existing relationship with OCTC..., so they have a good understanding of the workforce and what we do.

William Mounts, Vice President of OMICO Plastics, has become an industry leader in OCTC's work-based degree program, noting that,

> the relationship has been phenomenal, how they're so open to listening to what we're asking for. And they're willing to not only adapt it to their program, but how quick they do it.

From the college perspective, their existing relationship was only part of what was needed to initiate the conversation about a model for work-based courses that requires serious employer commitment. OCTC faculty member Lewis Nall described getting employers interested in his work-based courses.

> Part of that has been a relationship that I have been building for five years. I spend the summers and my Fridays...going to these dealerships and developing relationships with them. ...You've got to have that relationship with that shop foreman, with that supervisor, or with that owner. The second key is they're desperate for techs. They're really desperate for quality-trained technicians. ...So they need me as much as I need them.

The strong regional manufacturing economy, impending retirements, and lack of available talent opened employers up to trying creative educational and training approaches with OCTC. Top administrators of the Workforce Solutions division have leveraged backgrounds in industry to initiate discussions about these pressing talent needs with new employers.

RECRUITING EXISTING EMPLOYER PARTNERS

While it is never easy to sign a company on to a new form of education or training, it is easier to start with those employers that already know and work with the college in some way. The self-assessment results from Tool 1-4 can provide a starting point for thinking about which of your existing employer partners might be most interested in work-based courses. You may also want to focus on employers in subsectors that have the most demand for the graduates of your manufacturing programs.

Who are the manufacturers that have the deepest or most longstanding partnerships with your college?

_____ _____

_____ _____

Among these, have any been actively involved in designing or delivering training rather than relying primarily on the college?

_____ _____

_____ _____

Initiate a conversation among those employers that seem the most open to serving as active partners in program delivery to find out how their interests align with work-based courses. The companies that respond "yes" to some of the questions below could be strong partners for work-based courses.

Company:_____	Yes	No	Explain
Do you have talent gaps that require new training solutions?			
Do you have trouble finding qualified candidates to fill your job openings?			
Do you have an interest in upskilling your entry-level workers to fill your more skilled talent needs?			

Table continues on next page.

Company:_____	Yes	No	Explain
Do you have interest in on-the-job training for new employees that lasts at least several months and prepares them for positions beyond entry level?			
Do you currently have any form of on-the-job training?			
Do you expect supervisors or other senior technicians to help mentor/ teach more junior employees as part of their job responsibilities, or are you open to this?			
Does a degree or further education make it easier to advance at your company?			
College or company specific interests (specify) _____ _____			

RECRUITING NEW EMPLOYER PARTNERS

Work-based courses can be a good opportunity to cultivate new employer relationships or to deepen an employer's role from hands-off input to active engagement. Keep in mind that the appeal of work-based courses will be even stronger to new employers after the college has tested the model and other employers can speak of its value.

Several considerations can help you identify which manufacturers in your broader employer network to approach about work-based courses. Here are questions to answer internally at the community college:

Company:_____	Yes	No	List companies
Do you have employers on advisory boards or otherwise providing input in college program design but not taking advantage of any services?			
Have you been talking to any employers who are interested in working with the college but haven't found the right opportunity?			
Are there employers that you are specifically interested in building deeper relationships with?			
Have any employers approached you about work-based courses or other forms of work-based learning, such as apprenticeships and internships?			
Other employers (explain why they are included here): _____ _____			

For the employers listed above, particularly those who recur, begin to consider how to approach them:

Do you have connections to these employers to initiate the conversation, such as relationships with members of your advisory committee or other existing partners, faculty members who previously worked at the company, or shared participation on a local project or committee?

For those that approached you, how did they find out about work-based courses?

Based on what you know about each company, how do work-based courses fit in with their in-house training and any training needs they have expressed?

If you are housing the work-based course program in your academic department, do you have a strong relationship with your workforce solutions or customized training division? Describe that relationship:

JOINT EMPLOYER PARTNERSHIPS

Rather than pursuing each company partnership in isolation, colleges can benefit from bringing employers together.

Joint Meetings

Employers can be convened in one-time events such as focus groups, or they can be brought together on an ongoing basis in employer advisory committees to address an evolving set of program questions. Bringing employers together to hear from one another and provide collective input on your program planning can provide value to several early aspects of program definition:

- Identifying skill needs and courses of most value to local industry
- Monitoring emerging needs for future course development
- Exploring which competencies can most commonly be taught in the workplace
- Other: _____

In what ways does your college currently convene employers?

_____

_____

_____

On one hand, these companies are often competitors and can be reluctant to share their workforce challenges and training strategies with one another. On the other, having low-risk ways for employers to solve mutual problems can build some initial trust. The more employers come together and experience value from those interactions, the more likely they will be to provide frank input.

Are your employer partners already willing to share their insights in these groups?

_____ Yes, the current format of our meetings successfully gathers employer input

_____ No, more regular interactions among employers might help build necessary trust

Consortium Cohorts

Colleges that identify multiple manufacturers with similar needs can develop consortium classes comprising workers from more than one company. This is particularly valuable to small and medium-sized companies that are only able to enroll one or two employees in a work-based course at a time. If employers are already partnering through an employer advisory committee or other college activities, they may be more open to this kind of shared course. See Tool 3-5 for additional considerations about consortium cohorts.

Benefits to Manufacturers

Early work-based course employer partners have noted that participating in consortia benefits them as well. By coming together to oversee and deliver work-based courses, they have built an industry network of mutually supportive companies that provide ideas and assistance to one another for a variety of issues beyond work-based courses. Serving in this convening capacity is another way that a college can demonstrate its value to employers and deepen their relationships. See Becoming a Go-To Convener in the Employer Engagement Toolkit: From Placement to Partners for tips on how to become a valued employer convener.

BUILDING AN EMPLOYER'S TEAM

Just as different members of the college support work-based courses in different ways, after an employer commits to offering work-based courses, different people within the company will need to engage with the college. Clarifying these roles and the value that each employee brings to work-based courses is an important first step in building buy-in across the team. In addition, incorporating each of the perspectives that these team members bring will improve the work-based course design and implementation.

Consider these common roles for your employer team:

Training Director or HR Director

- Often the initial point of contact
- Creates company buy-in and commitment for the program
- Additional roles in your work-based course team:
  - _____
  - _____
  - _____

Content experts, such as a senior technician, supervisor, or training director

- Participate in job task analysis, competency mapping, and work-based course design. Note that team processes like a job task analysis are a simple way to engage multiple content experts in the course design.
- Contribute ideas about which competencies can be taught in the workplace and how that would occur.
- Additional roles in your work-based course team:
  - _____
  - _____
  - _____

Supervisor or peer mentor. This should be an on-site staff member, whether the work-based course student's regular supervisor or someone else with content expertise who is partnered with them.

- Provides regular oversight and instruction to work-based course students throughout the course. Different students may have different mentors, or one mentor might be assigned to multiple students.
- Communicates with college faculty about student progress and concerns, coordinates content delivery, and provides formal student assessments.
- Lead mentor might coordinate multiple content-specific mentors who participate in particular components within the course.
- Additional roles in your work-based course team:
  - _____
  - _____
  - _____

TOOL 2-4: WHAT WORK-BASED COURSES MEAN FOR… COMMUNITY COLLEGES AND FACULTY

Type of Tool: Marketing material

Summary: This sample brochure can be adapted and provided to college leadership and faculty members who are interested in exploring whether work-based courses would enrich their academic program. It provides a basic overview of what work-based courses are and what they look like from the community college perspective. The brochure expands on the role of community college faculty and staff within the team that is responsible for work-based course design and delivery. Finally, it offers potential benefits of work-based courses to a community college. This material should not be provided in isolation, but rather to maximize understanding in support of a conversation about work-based courses.

Why: The first materials that a college leader, faculty member, employer, or student sees about work-based courses will frame their understanding of the model and their expectations for being involved. These materials should provide a consistent understanding of work-based courses to ensure that all partners are working toward the same goal. At the same time, the materials should be tailored to their audience by incorporating the terminology that is meaningful to them, laying out their specific roles, and clearly stating the value proposition for them. Thus, Tools 2-4, 2-5, and 2-6 draw on the same core language but are customized for community colleges, manufacturers, and potential work-based course students.

Who Should Use this Tool: College administrators, faculty members

Spotlight on OCTC: The value of work-based courses to OCTC has been clear. They continue to expand the manufacturing courses offered in this format, and they are looking to expand it to other departments. Work-based courses have helped OCTC in a variety of ways, including expanding education and training to new students and manufacturers. President Scott Williams describes:

> You will beyond a shadow of a doubt create a tremendous support base, and that is you will get support not only from additional students and parents supporting their children going into this kind of a model, but number two is you will build a stronger business and industry support base.

Keith Boarman, Technical Training Coordinator for Business and Industry, reiterates this value:

> This project has been a real positive experience for Owensboro Community and Technical College. It truly has. It's actually probably provided us with some additional business, particularly with companies that haven't had a training program in the past.

WHAT ARE WORK-BASED COURSES?

Work-based courses are credit-bearing college courses that are co-designed and co-taught by college faculty and employers to meet academic course learning objectives in a way that maximizes, formalizes, and assesses learning that occurs on the job.

Work-based courses differ from other modes of adult education in that the learner identifies as an employee and the learning is continuous with the job itself, which is structured to achieve learning objectives. These objectives derive from the skill requirements of the job. Work-based courses emphasize work-based learning, with instructional approaches that capture, document, and reward learning that occurs on the job. They support career advancement for employees by providing a flexible model that fits with their lifestyle to earn academic credit, and sometimes industry-recognized credentials.

The delivery of work-based courses involves instructional strategies that strengthen adult learning, employing such techniques as problem-based learning, student portfolios, learning teams, coaching and mentoring, flexible schedules, the use of teachable moments during work, and observation and demonstration. Once students demonstrate mastery of the competencies, they receive academic credit.

What This Looks Like at a Community College

Work-based courses build on hands-on problem-based learning in the classroom and laboratory settings as well as customized training that your college may already provide to local employers.

Faculty may recognize several attributes that together define work-based courses:

- Curriculum, teaching, learning, and assessment embedded in the work process for contextualized, hands-on applications of theory
- Adult-oriented teaching style including self-direction and critical thinking
- Award of academic credit for demonstrated mastery of work activities that reflect specific competencies of course learning objectives
- Classroom, online, or hybrid instruction to supplement workplace learning as needed

Their Value to You

Higher enrollment and revenue; improved student outcomes; professional development for faculty members; opportunities to develop new programs and partnerships and initiate institutional reforms.

> “It makes me a better teacher, too, because I realize, ‘Am I giving him the tools?’ If I have that student for 45 lecture hours, contact hours, and 90 for lab time, am I giving that student what he needs? How do we know as instructors if we’re doing a good job? Well, the only real proof is: What can your student do when he gets out there and he has to do it.”
>
> – Lewis Nall, Program Coordinator for the Automotive and Diesel Program, Owensboro Community and Technical College

JOINT DELIVERY

Faculty, employer supervisors or mentors, and other staff all have responsibilities for designing and delivering some of a work-based course. Together, you determine how learning occurs and what supportive materials work-based course students need. Curriculum is co-designed by educators and employers to ensure that courses meet employer and worker needs, while also meeting rigorous academic standards for degree attainment.

Work-based courses require a strong partnership between the employer and education and training organizations, sometimes joined by labor and community organizations. As partners, you collaborate to determine the competencies needed for a particular occupation, then you structure ways to teach the competencies in a work setting. This may be supplemented by classroom, online, or hybrid instruction.

Your Role

- Educators co-design and teach curriculum with employers
- Faculty members work with employer representatives to determine the work activities that can be used to develop, demonstrate, and document the achievement of course competencies
- Faculty members adapt existing manufacturing courses to a delivery model that maximizes work-based learning: mapping competencies within a course, determining assessment standards, and obtaining institutional approval
- Community colleges provide professional development to increase faculty capacity to educate incumbent workers through these methods tailored to adult learning styles
- Faculty members transform your traditional roles to become learning guides and facilitators as much as teachers

TOOL 2-5: WHAT WORK-BASED COURSES MEAN FOR… MANUFACTURERS AND SUPERVISORS

Type of Tool: Marketing material

Summary: This sample brochure can be adapted and provided to manufacturers who are interested in exploring whether work-based courses would strengthen their workforce training. It provides a basic overview of what work-based courses are and what they look like from the manufacturer's perspective. Company leadership, human resource managers, or training directors will likely be the first audience for outreach about work-based courses, but the materials can also be helpful to supervisors or other employer mentors who become part of a team responsible for work-based course design and delivery. The brochure expands on the roles of various company staff within that team. Finally, it offers potential benefits of work-based courses to a manufacturer. This material should not be provided in isolation, but rather to maximize understanding in support of a conversation about work-based courses.

Why: The first materials that an employer, college leader, faculty member, or student sees about work-based courses will frame their understanding of the model and their expectations for involvement. These materials should provide a consistent understanding of work-based courses to ensure that all partners are working toward the same goal. At the same time, the materials should be tailored to their audience by incorporating the terminology that is meaningful to them, laying out their specific roles, and clearly stating the value proposition for them. Thus, Tools 2-4, 2-5, and 2-6 draw on the same core language but are customized for community colleges, manufacturers, and potential work-based course students.

Who Should Use this Tool: Program administrators, manufacturing executives, human resource managers, training directors, employer supervisors

Spotlight on OCTC: Work-based courses follow on a tradition of work-based learning in the manufacturing industry, with employees learning skills on the job that support a company's specific production process. Cindy Fiorella, Vice President of OCTC's Workforce Solutions, describes the benefits of work-based courses in that manufacturing context as compared with traditional classroom courses.

Reaping the benefits of work-based courses requires a significant investment by manufacturers, including expert time designing the course, supervisor time training workers while in production, and tuition costs. Companies may question whether the time and costs of developing and delivering a work-based course are worth it. As Marty Higdon, Assistant Professor in the Electrical Technology program at OCTC, considers:

> If you don't get work-based learning…then the [work-based course] value-added…doesn't come very quickly. But if you start realizing …[and a student is] going through motor controls and they're sizing overloads, for example, and if you know that as a supervisor you have a problem with a motor tripping out, all of a sudden you realize what capabilities that student has, and you can start utilizing a student at a higher level. So your…return on investment is going to be much quicker than what it would be if you…weren't involved. So it just makes sense for supervisors to be involved…where they can.

Several manufacturers involved in the early delivery of work-based courses at OCTC have recognized that "you can't look at everything as a cost from a business aspect. It has to be an investment."

William Mounts, Vice President of OMICO Plastics, explains that work-based courses are an

> "investment up front to be able to train these people…to your standards, your behaviors, instead of somebody coming from a different organization and they either learn to behave the way you want them to, or [you are] constantly retraining them to behave the way you want them to, or you eventually have to terminate them."

The importance of a company's work culture has been part of the reason work-based courses have been effective for OCTC's employer partners interested in upskilling their current workers as well as hiring workers new to the industry.

WHAT ARE WORK-BASED COURSES?

Work-based courses are credit-bearing college courses that are co-designed and co-taught by college faculty and employers to meet academic course learning objectives in a way that maximizes, formalizes, and assesses learning that occurs on the job.

Work-based courses recognize that the student is an employee first and the learning is continuous with the job itself, which is structured to achieve learning objectives. These objectives derive from the skill requirements of the job. Work-based courses emphasize work-based learning, with instructional approaches that capture, document, and reward learning that occurs on the job. They support career advancement for employees by providing a flexible way to earn academic credit and, sometimes, industry-recognized credentials.

What This Looks Like at a Company

The concept of learning in the workplace is not new: All workers receive informal, on-the-job training. Work-based courses share features with and build on other forms of learning associated with the workplace that you may already provide, including on-site classes, internships, and apprenticeships. The key element of work-based courses is that assignments use actual work tasks and responsibilities to teach both applied and academic skills as part of a discrete college-level course.

Company leadership and supervisors may recognize several attributes that together define work-based courses for a company:

- On-the-job training with a supervisor or experienced mentor to guide student learning
- Assessment process that builds on existing company assessments to verify an employee's qualifications to run production equipment as applicable
- Support from college instructor to identify learning opportunities and align that learning with larger course objectives
- Classroom, online, or hybrid instruction provided by the community college to supplement workplace learning as needed

Their Value to You

Work-based courses are valuable to you. They provide a workforce trained for your needs, reduced costs and higher productivity, higher worker morale and retention, and direct financial benefits.

> Since the implementation of these programs, we've seen a marked improvement in terms of retention, ...morale, [and] also just general knowledge and skill. And that is very important in our industry in order to stay competitive. By having these programs in place and by our employees achieving all of those things...it is definitely working out for us in the long run.
>
> - Donald Woolridge, Human Resources Manager, Aleris Corporation

JOINT DELIVERY

Faculty, employer supervisors or mentors, and other staff all have responsibilities for designing and delivering some of a work-based course. Together, you determine how learning occurs and what supportive materials work-based course students need. Curriculum is co-designed by educators and employers to ensure that courses meet employer and worker needs, while also meeting rigorous academic standards for degree attainment.

Work-based courses require a strong partnership between the employer and education and training organizations, sometimes joined by labor and community organizations. As partners, you collaborate to determine the competencies needed for a particular occupation, and then you structure ways to teach the competencies in a work setting. This may be supplemented by classroom, online, or hybrid instruction.

Your Role

- Employer supervisors or other experienced mentors, together with college faculty, identify work-related tasks that have learning potential that aligns with course competencies
- Employers co-design and co-teach curriculum with educators; supervisors or mentors share in instruction, coaching, and assessment
- Supervisors and others at the workplace understand the competencies required for college credit and the requirements for accreditation
- Employers provide broad support to the work-based course student such as flexible scheduling to attend classroom components of courses or access to computers to complete online coursework
- Employers help educators navigate a variety of workplace regulations

TOOL 2-6: WHAT WORK-BASED COURSES MEAN FOR… MANUFACTURING WORKERS AND STUDENTS

Type of Tool: Marketing material

Summary: This sample brochure can be adapted or provided to manufacturing workers or community college students who are interested in exploring whether work-based courses would strengthen their careers and deepen their education. It provides a basic overview of what work-based courses are and what they look like from the student's perspective. The brochure expands on the role of the individual as both a worker and student. Finally, it offers potential benefits of work-based courses to a student. This material should not be provided in isolation, but rather to maximize understanding in support of a conversation about work-based courses.

Why: The first materials that a student, college leader, faculty member, or employer sees about work-based courses will frame their understanding of the model and their expectations for involvement. These materials should provide a consistent understanding of work-based courses to ensure that all partners are working toward the same goal. At the same time, the materials should be tailored to their audience by incorporating the terminology that is meaningful to them, laying out their specific roles, and clearly stating the value proposition for them. Thus, Tools 2-4, 2-5, and 2-6 draw on the same core language but are customized for community colleges, manufacturers, and potential work-based course students.

Who Should Use this Tool: Program administrators, career navigators, prospective students, incumbent workers

Spotlight on OCTC: OCTC's interest in work-based courses ultimately comes back to their interest in positioning their students for success. In its early implementation, most work-based course students have academically outperformed students taking traditional courses, in part because of the connection between the course content and their jobs. OCTC's faculty and students describe these results eloquently. Cindy Fiorella, Vice President of Workforce Solutions, exlplains the benefits:

> We consider it a best practice because it offers greater relevance to the student. It offers greater mastery for the student whenever they can see the application in a work setting that they're familiar with.... It makes more sense to them than it does when it's taught strictly in a classroom lab environment because they see the practices.

Work-based courses also set up incumbent workers for long-term career success beyond what customized training can usually provide. As OCTC faculty member Lewis Nall notes:

> I don't want to just train my students to work today. I want to train that student so that when he graduates, he understands what's coming, where the technology is going, and that he has a thirst for that. Success breeds success.

Work-based course students have experienced this value firsthand; including Tyler Ashton, student at OCTC and employee of OMICO Plastics:

> It's been a great opportunity, and I hope I work at the company I'm sponsored at for a long time. But...if something ever happens I know that [this] education will allow me to find another job or another opportunity somewhere else...[OMICO's] sponsoring me and giving me that opportunity...shows a lot of loyalty to me.

WHAT ARE WORK-BASED COURSES?

Work-based courses are credit-bearing college courses that are co-designed and co-taught by college faculty and employers to meet academic course learning objectives in a way that maximizes, formalizes, and assesses learning that occurs on the job.

Work-based courses recognize that you are an employee first and that you are learning on the job. They are designed to ensure that the skills you learn in the workplace can be documented, assessed, and rewarded in academic terms. Work-based courses support your career advancement by providing a flexible way to earn academic credit, and, sometimes, industry-recognized credentials.

What This Looks Like to a Work-Based Course Student

Work-based courses share some features with other training you may have received at work, as well as with manufacturing courses you may have taken at college. The defining element of work-based courses is that course assignments use actual work tasks and responsibilities to teach both applied and academic skills.

Work-based courses have several fundamental attributes relevant to your experience:

- Community college credit is earned for demonstrating mastery of your work activities that are part of the course curriculum
- Classroom, lab, or online instruction through the community college adds to what you learn during work
- A supervisor or other senior employee serves as a mentor to guide your learning
- Workplace mentor and college instructor work together to make sure you are learning what you need to succeed in the course and at work

Their Value to You

Work-based courses have tremendous value for you. They provide training to advance your career, college credit toward a manufacturing degree, the ability to earn while you learn, and access to college resources.

> The person can also be earning a living while they are going to school. And that oftentimes becomes . . . a speed bump for many students. 'How do I balance family and life with job and going to school to advance myself in the job or career field?' This allows them to do that all at once, and I think that provides a little bit of flexibility that we normally don't think about.
>
> - Scott Williams, President and CEO, OCTC

> I personally learn better from hands-on experience, like actually getting my time in, and repetition...At school...you kind of get the general idea of it and ...anybody can look in a book and pass a test, but when you get out here it's totally different...[My supervisor] has been more than happy to answer [my] questions ... and then sometimes we actually go back to school with questions for the teacher that we get from [work. The supervisor]...lets us try to figure it out ourselves first usually, and if we have questions or we can't do it he's always right there.
>
> - Tyler Ashton, student at OCTC and employee of OMICO Plastics

JOINT DELIVERY

Faculty, worksite supervisors or mentors, and other staff all have responsibilities for designing and delivering some of a work-based course. Together, they determine how learning occurs and what supportive materials you need. Curriculum is co-designed by educators and employers to ensure that courses meet employer and worker needs, while also meeting rigorous academic standards to make sure you earn a degree.

Your Role

- You are a worker first. Your job responsibilities may continue in the same department where you already worked, or you may move to new departments to perform new job tasks and learn about different aspects of the company.
- You are also a college student. You may be required to attend class or lab, complete coursework on line, and take quizzes or tests. If you are enrolled in other college courses, a work-based course will fulfill degree requirements just like a traditional, classroom-based version of the same course. It doesn't replace program requirements, but you may be able to take several classes in this format, depending on availability at your college and company.
- You are the link between your work and the college, so you will be expected to support communication between your employer supervisor and your college instructor. Ask your instructor about situations that you experience at work, and bring questions from your homework to your employer supervisor.
- Tuition costs will vary depending on arrangements between you, your college, and your employer. Speak to your company to learn more about any costs you would be responsible for.

SECTION 3: DESIGNING THE COURSE AND

CURRICULUM

EVEN THE BEST LAB IS NOT THE WORKPLACE.

- Marty Higdon, OCTC faculty

The closer we can align technical training programs with the real needs of industry, the better we can provide students and employers with what they need to be competitive and successful. Career and technical education programs generally are designed with these goals in mind, and seek to prepare students with the skills and experience necessary to perform in the workplace. Well-designed and aligned programs emphasize the relevance and connection of classroom training to the world of work, and many programs integrate work-based learning opportunities like co-ops or internships to strengthen this connection. Work-based courses, however, take this concept further, blending work experience with classroom learning so that work itself serves as a formal learning environment.

Designing curricula for this model requires a significant overhaul of the content, delivery, and scope of existing course offerings, and requires a college to work collaboratively with industry partners and program developers to create learning activities that reach beyond the existing confines of the classroom and into the workplace. Essentially, a work-based course model asks a college to rethink curricula and expand on the concept of preparation *for* the workplace to incorporate learning *in* the workplace.

Section Three provides tools aimed at selecting courses, mapping competencies and job tasks, designing instructional delivery, and assessing learning in multiple contexts. These tools are designed to prompt critical analysis of existing college practices, and to promote a process for aligning curricula with industry needs and promoting student learning and development.

FOSTERING COLLABORATION

To implement a work-based manufacturing course model, colleges must work collaboratively with the local manufacturers to determine the skills most in need. This work goes far beyond general consultation on curricular content, and should be approached as a partnership to co-design curricula. Conversations should start early in the process of program development and focus on connecting faculty with industry representatives who have a full grasp of the skills, training needs, and gaps the model will address. These conversations should establish shared goals and a vision for the model, as well as build rapport between college and industry as the work progresses.

Colleges should identify and establish curricular development teams that draw on faculty teaching expertise, employer supervisors or expert operators at local companies, and other institutional or industry training experts to ensure that the goals of each individual stakeholder are met. This collaboration and co-design are critical to ensure that learning in all contexts is thoughtfully and creatively designed, rigorous, and structured with worker matriculation in mind.

DESIGNING COURSE CONTENT

Designing curricula for a work-based course begins with a detailed analysis of job tasks and responsibilities. This process of job-task analysis should be done with each employer or company to determine not only what areas are most in need of training, but also to establish trends among the industries in the region. As part of this process, employers, supervisors, industry training representatives, and others meet with college faculty and designers to map out course content. Job tasks are analyzed for frequency and importance, then mapped on to existing course structures. This process is a crucial first step, and it is important to balance the strict needs of particular companies with the scope of learning necessary to uphold the rigor of a credit-bearing course. In many instances, this process will require negotiation and revision of course materials, often in an iterative manner. In this way, the needs of industry, and specific companies, are met while adhering to academic principles and accreditation standards.

Most often, colleges will adapt existing courses for the work-based course model. Colleges should use existing syllabi and curricular outlines to determine what could be augmented to fit a work-based course approach. In some instances, a new course will need to be developed based on feedback from industry and employers. Either way, concept mapping of tasks to course content is similar and will require detailed conversations about what is necessary for foundational knowledge, skill mastery, and performance of job tasks.

DESIGNING INSTRUCTION FOR MULTIPLE SETTINGS

> I think that work-study piece is critical, because classroom training is one aspect, but when they are able to see that on a real asset or in a real manufacturing setting, I think it makes them understand what they've learned in a classroom and have the ability to actually apply that knowledge. So learning about it in a class is one aspect of it, but being able to apply that knowledge in on-the-job training is critical to them becoming a proficient operator.
>
> - Tim Sheldon, Organizational Effectiveness Specialist, Kimberly-Clark

The most significant and motivating aspect of the work-based course model is the varied approach to instructional delivery. The work-based course model is built on the idea that work is instructive, and deploying the workplace as a learning lab leads to stronger knowledge and refined skills. In doing this, work-based courses blend classroom fundamentals, safe and structured practice, and real-world applicability in one course.

Mapping curricula to job tasks lays the foundation for the process of designing instruction for the classroom and the job, and colleges will need to evaluate how best to deliver instruction in multiple settings. Colleges should examine how competencies can be taught based on a number of variables, including available tools and materials and risk and compliance measures, and determine what content is served by which delivery site.

The critical underpinning of work-based courses is the idea that for learning in general, and for technical education in particular, practice and application of knowledge should include real-world context. Many course competencies are taught best in a classroom setting, including theory or background knowledge, but others require hands-on practice and experience. In mapping out where and when instruction can take place, colleges should think broadly about tying in experiential learning practices and the need for real-world scenarios, as well as honoring a student's need for practice and development prior to assuming some responsibilities in the workplace. In turn, hands-on learning reinforces the student's commitment to developing learning and skills.

The instructional delivery planning worksheet in this section allows colleges and companies to explore together what makes the most sense in terms of deep learning. In using this worksheet, colleges should map out all possible instructional scenarios, and then determine which has the most impact balanced by feasibility for the workplace. For many activities, there will be more than one way to deliver instruction, and it may be a matter of determining what is taught in one place and reinforced in another. Additionally, some content areas that are more workplace-specific may require that a college faculty member work with an individual employer supervisor in designing specific activities outside a general class.

HARNESSING THE POWER OF THE EXPERT OPERATOR

Work-based courses broaden the instructor role to include both faculty and employers. For both the classroom and the worksite, it is important to determine who is best suited to instruct students. Ultimately, faculty should be chosen based on their experience teaching, their experience in industry, and their willingness to innovate. Employer supervisors or other expert mentors should be selected based on a combination of interest in developing trainees, their disposition and ability to mentor, and their expertise in the sector. Expert mentors are not necessarily the student's direct supervisor, but they supervise student job responsibilities and learning in the workplace during work-based courses. Both need to be willing to collaborate and build on each other's strengths. Often, supervisors are a first choice for this role, although it could be that an expert team member or company veteran may be a better fit. Employers need to think about the ways in which the employer supervisor will interact with the student while completing job tasks.

ASSESSING FOR MASTERY

> It actually also provides more of a model where it's mastery, where they have mastered the skills. Let me explain what I mean by that. In an average academic course, as long as I can pass with 60 or 70 percent of the knowledge, I get through the class. But that means there's 30 or 40 percent of the material that I really didn't master....In this work-based model, those students are mastering all those essential skills, and I think that helps us ensure that when we're transcribing the credits that an employer or end user of that student can feel very comfortable that they've mastered what everybody feels like are essential skills for them.
>
> - Scott Williams, President, OCTC

The theoretical foundation of the work-based course model is the idea that the workplace is itself a learning lab and platform for demonstrating, reinforcing, and assessing skills on the job. Assessment is key to making sure that these opportunities are documented and formalized, so that the learning that takes place in each context is acknowledged and supported.

Work-based courses are uniquely designed to promote deeper engagement with content, as the student is learning and applying knowledge and skills simultaneously, and assessment should reflect this. Simple instruments like written tests or quizzes, or "can-do" checklists, are helpful, but should not be used as the full measure of knowledge and ability. For work-based courses, experiential learning, or learning through doing and reflection, drives the assessment process. Program developers of work-based courses should integrate practices of both formative and summative assessments for learning. As much as possible, assessment should be linked to company job performance processes and benchmarks to help students understand how skills and knowledge are evaluated and rewarded on the job.

Designing assessment practices requires strong communication, agreement on mutual goals, and commitment from both college and industry. Wherever possible, employers and college faculty should share assessment documents, collaborate on assignments or projects, and generally work to inform the practice of one another. Sound assessment design can enable both employers and the college to identify specific goals and communicate degrees of student progress. Employers can provide valuable information for faculty on how a student performs a particular skill on the job, and faculty can inform employers on when a student has demonstrated sufficient understanding of a new concept or skill and is ready to carry out a work task. This symbiosis is critical to gathering the full range of information on a student, and it forms the cornerstone of any successful work-based course program.

Additionally, work-based course assessments can promote mastery, rather than simple competence, on the job. For a student to successfully demonstrate mastery, he or she must be able to perform in both the classroom and the workplace. This establishes a strong foundation and shows the student's ability to use, transfer, and apply knowledge from one context to another—skills that employers continually cite as integral to work performance. Also, it provides a launchpad to help students and workers continue to advance once they are employed and as part of a career development plan.

This section provides several tools to guide work-based course design, starting with selecting which existing courses to adapt to this format. Once a course has been selected, the tools provide a process to design three critical elements of a work-based course at a detailed level: course competencies defined in relation to job tasks; the determination of work-based, classroom, blended, or online delivery for each course competency; and assessment instruments to evaluate whether the competencies have been mastered. The final tool helps colleges consider whether an employer has sufficient demand from its own cohort, or whether courses should be offered through employer consortiums on a broader industry basis, providing opportunities for portability and for customization by individual companies.

TOOL 3-1: DETERMINING WHAT COURSES TO ADAPT

Type of Tool: Action guide

Summary: The first step in your course design process is selecting which courses to adapt from their existing, traditional format to a work-based delivery. The decision will be based on a variety of factors unique to your college and region, but some basic activities and considerations can guide your selection process. This tool provides guidance on creating work-based courses that bring together the skills needs of employers with the educational strengths of community colleges. The tool also includes considerations of which types of courses may be best suited for this delivery format and how to consider adapting multiple courses simultaneously. While the activities in Tool 2-3 focus on who you should engage as an employer representative on a work-based course team, the activities in this section focus on designing course content.

Why: Early planning about which courses to adapt will pay off in several ways. First, work-based courses will be most effective if they maximize the degree to which they align with the needs and assets of both partners, and so these attributes should be the basis of the decision- making process. Second, adapting work-based courses without uptake by employers wastes significant resources, because adapting each course is a time-intensive process. Identifying multiple employers with interest in a particular work-based course will help ensure that the investment in course development pays off. Third, these conversations are a useful way to build the relationship between employers and the college that will be essential to ultimately delivering these courses. Finally, this process gives colleges deeper insight as to how work-based courses can work together and with traditional courses to lead to a manufacturing degree.

Who Should Use this Tool: Program administrators and members of the core work-based course team

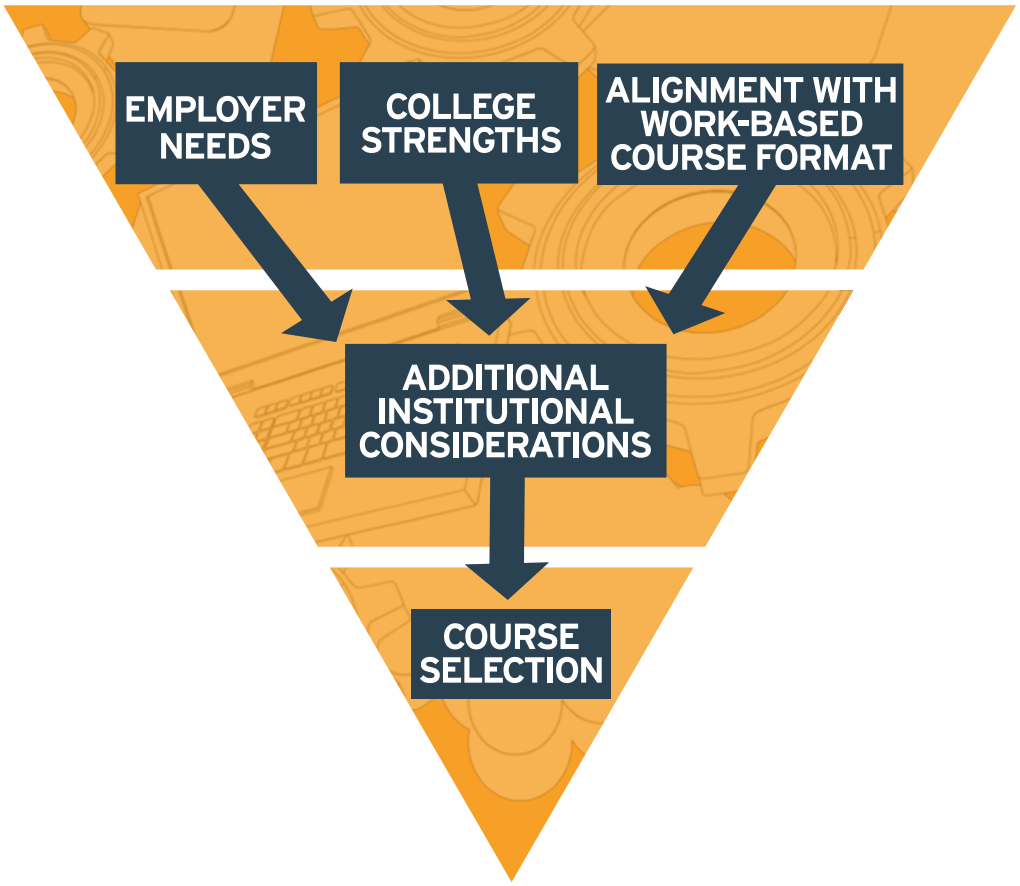
Spotlight on OCTC: OCTC knew from the start that it wanted to adapt numerous work-based courses, not just one or two, and the model would be their new way of doing business with employer partners. Still, OCTC went through a deliberate process with a wide range of manufacturers to select the first few courses to adapt. Through conversations with individual companies and an employer focus group, OCTC listened to employer needs and learned how they thought specific work-based courses could fit into their training. When employers came together, they echoed each other's needs for specific skills and occupations. Through this process, OCTC selected several courses most in demand. Employers found the courses developed as a result of these conversations to be responsive to the interests they identified, so the college was then able to use these popular work-based courses as a launchpad for building out a wider array of work-based courses.

With a stable of work-based courses, OCTC is now able to enter an even more detailed process to identify the courses most relevant to employers. They may offer existing work-based courses or develop new ones. Irvin Rothgerber, the maintenance trainer at Waupaca Foundry Plant Five, describes their workers

> doing a hydraulic schematic...and then putting the hydraulic system together. The [OCTC] instructors there are taking notes, and then will base our classes off...where their skill level is in that assessment...We'll try to organize or put together classes on that information.

ALIGNING PARTNER NEEDS

This tool provides ideas to bring together employer needs, college strengths, and key attributes of work-based courses in order to select the first course or courses to adapt to a work-based learning format.



Employer Input

Employers are a major driver of work-based courses: the students are their workers, the on-the-job learning happens in their workplace, and their supervisors provide the hands-on instruction. These courses cannot happen without fully engaged employers, and so the course selection process should gather their input from the beginning.

Strategies to Collect Input

- Survey companies you have provided training for in the past, that frequently hire your graduates, or with whom you have begun partnership discussions. This is a quick way to get a snapshot of the landscape. You may have to ask the questions in a quick phone call if that is the format most convenient for employers. This can be a way to further target the occupations or skills to prioritize in a work-based course.

- Convene a focus group of employers. While it can be difficult for employers to make time to attend an in-person event, talking with other employers can provide great value. This gives employers opportunities to identify their common needs and to give each other ideas about how work-based courses could complement their existing training activities. If you need help, enlist your economic development leaders to participate.

- Meet with one or two key partners with whom you are already working to determine how you can best serve their educational needs and to see whether work-based courses seem like a natural fit. If so, you can explore whether it would make sense to adapt specific classes to the work-based format regardless of interest from other employers.

Employer Considerations

Find out what types of educational opportunities employers are seeking:

- What are their primary skill needs, or positions that they have the most difficulty filling? Do their current skills gaps require short-term, medium-term, or long-term training?

- Are they only interested in highly targeted customized training or open to more comprehensive technical education?

- How will work-based courses fit in with their other training activities? Will it feed into existing, advanced training such as an apprenticeship? Will it fill an emerging skill need that has not yet been addressed?

- What are the educational levels of the employees who will receive the training? Are they college ready, have they completed college courses, or do their educational backgrounds vary?

- What are their career expectations for employees who receive training? Will they be promoted in conjunction with the training, or learning skills for their current occupation?

Landscape of Educational Needs

Analyze the input you have collected from employers to identify any common themes that could be addressed for groups of employers.

- Are employers looking to train workers for similar occupations or skill sets? If so, what are the top occupations that need training? How do these skill sets map onto the competencies taught in the college's manufacturing department?

- Are employers focused on front-line workers, middle-skilled positions, or more advanced training? Or could they benefit from educational opportunities across a career pathway?

- Are the companies open to a consortium training with other employers, or do they want the course delivered to them individually?

College Manufacturing Program

Work-based courses are distinct from other forms of employer-driven manufacturing education because they are drawn from credit-bearing courses that are requirements within a college's manufacturing degree and certificate programs. They are not intended to provide generic credit but rather to provide an alternative format for technical courses required for program completion that also advances student careers. Several guiding questions can help a college determine their interest in selecting a specific course or courses to be work-based courses. You may refer to the results of your self-assessment in Tool 1-4, and refine those answers to be course-specific:

- Does the faculty have greater capacity to offer certain courses, or is the faculty already at its limit in delivering specific courses?
- Are there courses that require capital investment that have prevented their growth in the traditional format? If so, could the equipment at the worksites of employers substitute for that equipment in the college labs?
- Are some courses foundational or relevant to multiple degrees or certificate programs? Would offering any of those courses provide a greater range of opportunities for students?
- Are any courses regularly oversubscribed, so that they could benefit from another mode of delivery to meet student demand?

ALIGNMENT WITH WORK-BASED DELIVERY

Not every course makes sense as a work-based course. Look at the courses within your manufacturing department and consider whether the content of each course lends itself to work-based delivery:

- Is the course content more theoretical or hands-on? Hands-on learning is generally a better match to work-based courses.
- Do the job tasks that align with course competencies vary widely across employers? Some variation maximizes the benefits of this delivery, allowing students to learn from a real environment they might not recognize in the classroom. However, if the workplaces look too different, it might be hard for a student to learn the underlying universal concept that they could take into a different workplace.
- How often are the skills required at work? Even if certain skills are critical for employees to learn, they might not be put to use on a regular basis, making it harder to teach them in the timeframe of a course.

BRINGING IT ALL TOGETHER

You have now identified potential work-based courses from the perspective of the employer, the college, and the instructional delivery. Where do these potential courses overlap? You might have one course identified in all three ways, or you might have a dozen. Select a subset of courses from this list based on any additional considerations that are relevant to you, such as:

- How many courses can you afford to redesign for this delivery?
- Do you have priority employer partners with specific work-based course preferences?
- Would you like to select courses that stack to a specific degree or certificate, or would you like to offer work-based courses relevant to a wider range of your manufacturing programs?

TOOL 3-2: MAPPING TASKS TO COMPETENCIES

Type of Tool: Worksheets

Summary: This tool is designed to assist in the translation of job tasks to course competencies. It outlines a process for supervisors and other employer experts to document the competencies required for a job, and to compare them to the competencies outlined in the course. The process has much in common with popular job task analysis processes such as the DACUM or SCID, but is not as time or resource intensive. Instead, it focuses on the information needed to redesign the delivery format of the college course.

Why: Work-based courses need to translate real-life job tasks into course content, and these tools provide a format for the process. In using these tools, employers are able to see how their job activities can translate to components of instruction, and colleges can come to understand what is most in demand in the real world. This mapping is essential to ensuring that work-based courses are grounded in the context of the manufacturing sector and local companies while also adhering to the rigors of college-level course design.

Who Should Use this Tool: Teams consisting of career and technical education faculty and employer representatives, ideally those who will be acting as supervisors or mentors.

Spotlight on OCTC: At OCTC, faculty and employers worked closely together to identify job tasks and map them onto academic competencies. The collaboration was essential to creating an effective work-based course.

> We worked together developing that program and developing the task lists and the on-site . . . went through the plant—the on-site tour. That's what it was, on-site tour. And two heads are always better than one, right? So he had input. I had input. The company had input. And we feel like we came up with a really good product there.
>
> –Marty Higdon, OCTC faculty

TASK TO OBJECTIVES MAPPING

Converting Traditional Course Content to a Work-Based Course Format

Task and competency mapping is essential to designing a work-based course, as it gives both faculty and employer partners the opportunity to determine what skills and information are critical in a work/learning setting. In developing a work-based course, we recommend using an abbreviated, "lighter-touch" task or job analysis process in order to focus on revising existing course content.

Job Task Analysis: Many programs conduct fuller task or job analyses in full-scale program development or program evaluation efforts through methods including DACUM (Developing a Curriculum) or SCID (Systematic Curriculum and Instructional Development). In these instances, the job or task analyses are more highly structured, lengthy, and detailed than what is required for adapting work-based courses. DACUM International Training Center at Ohio State University's Center on Education and Training for Employment and the US Office of Personnel Management provide additional information about job task analyses.

Questions to Address in the Light Touch Task Analysis

Are you designing a new course to be delivered in a work-based learning model?

If yes, start with the Job (backward mapping)

- **Inventory:** What tasks exist in the job? Identify these through subject matter expert interviews, supervisor interviews, job descriptions, or a full-scale task analysis.
- **Selection:** What tasks are necessary or relevant for job performance? Which are essential?
- **Analysis:** What are the tasks comprised of? What knowledge is needed for completion? What supporting tasks or skills are needed?
- **Sequence:** In what sequence are the tasks laid out? In what order do you perform them?
- **Alignment:** How do you align tasks with performance? How are tasks transformed into performance objectives?

Are you adapting an existing course to be delivered in a work-based learning model?

If yes, start with the Course (forward mapping for work-based courses)

- **Inventory:** What competencies (or learning objectives) in the course are supported on the job? Faculty interview subject matter experts or supervisors on the job to identify the knowledge necessary to complete job tasks, and what skills and competencies can be taught and reinforced there.
- **Selection:** What competencies are the most needed, or most frequently used? What is emphasized or deemphasized on the job? Designate those that are not commonly used by employer partners to be taught in the classroom or by way of online or self-paced instruction.
- **Analysis:** What subskills are necessary for the main learning objectives to be mastered? What undergirds the tasks and skills necessary for job performance tasks? Ask employer partners to identify those skills that are the most in need and in most demand on a daily basis.
- **Sequence:** Determine preliminary sequence in which things should be taught, practiced, or mastered, both on the job and in the classroom.

Process for Conducting the Light Touch Task Analysis

- Outline existing learning objectives and goals from course, designated as tasks.
- Through interviews, surveys, or focus groups, ask employers and subject matter experts to select and rate by importance, frequency, and difficulty the learning objectives (job tasks) necessary for mastery on the job.
- Faculty and employer partners work together to group tasks into related modules according to importance, frequency, and degree of difficulty.
- Sequence modules and reformat course depending on feedback.

"LIGHT" JOB TASK ANALYSIS WORKSHEET (INVENTORY AND SELECTION)

Course Module:_____

Importance Scale	Frequency Scale
How important is this task to the job?	How often is the task performed?
0 = Not Performed	0 = Not Performed
1 = Not Important	1 = Every few months to yearly
2 = Somewhat Important	2 = Every few weeks to monthly
3 = Important	3 = Every few days to weekly
4 = Very Important	4 = Every few hours to daily
5 = Extremely Important	5 = Hourly to many times each hour

Task	Importance	Frequency
What tasks found on the job could be taught in the course?	How important or critical are they?	How frequently do they occur on the job?
EXAMPLE: Maintaining pneumatic transmitters	*4*	*3*

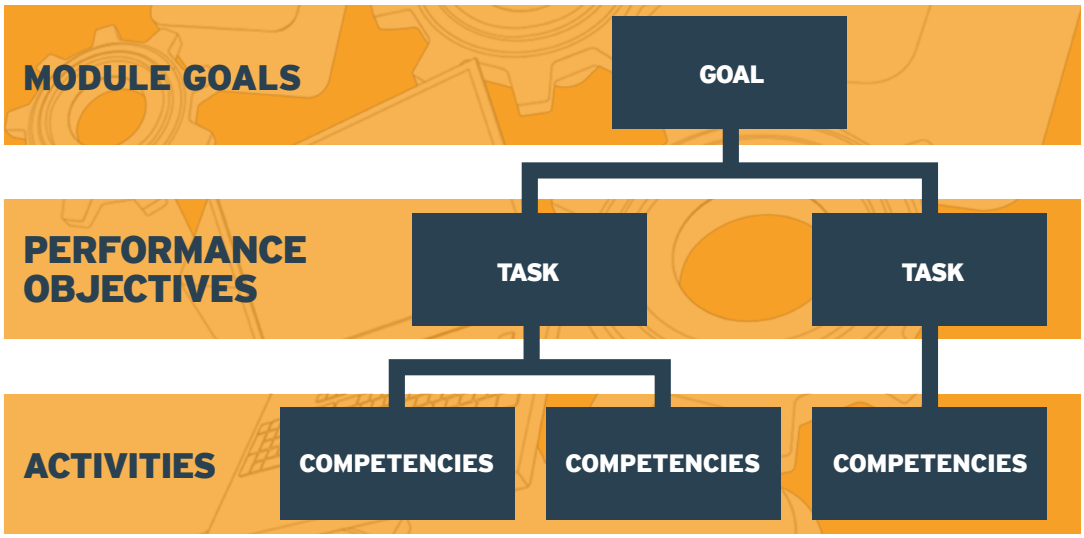
COMPETENCIES AND SUB-SKILLS WORKSHEET (ANALYSIS OF COURSE COMPETENCIES)

For each task, ranked from most important to least, outline the competencies and subskills needed to perform at a mastery level. Take time to think about the nature of the competencies needed for each task; define them in terms of knowledge, skill, or ability. This categorization can later assist in the designation of instructional settings from workplace, to classroom, to online/self-study.

Knowledge	An organized body of information, usually factual or procedural in nature.
Skill	The proficient manual, verbal, or mental manipulation of data or things.
Ability	The power or capacity to perform an activity or task.

Task	Competency	Competency	Competency
What tasks on the job could be taught in the course?	What underlying knowledge, skill, or ability must a worker possess to complete the tasks?		
EXAMPLE: Maintain pneumatic transmitters	*Identify and explain pneumatic transmitters* *(knowledge)*	*Inspect pneumatic transmitters* *(skill)*	*Troubleshoot pneumatic transmitters* *(ability)*

Now, group together tasks in modules or units. These may remain in a similar grouping as in your existing course, or there may be some revision based on employer partner feedback.



Content Grouping (Module Goal)	Tasks/Objectives	Competencies
1.	Tasks x-xx	1. 2. 3.
2.		1. 2. 3.
3.		1. 2. 3.
4.		1. 2. 3.

RESOURCES AND REFERENCES

1. Annett, J., & Duncan, K. D. (1967). Task analysis and training design.
2. Dick, W., Carey, L., & Carey, J. O. (2005). The systematic design of instruction.
3. Jonassen, D. H., Tessmer, M., & Hannum, W. H. (1998). Task analysis methods for instructional design. Routledge.
4. Terlouw, C. (2014). Instructional design for higher education. Instructional Design: International Perspectives II: Volume I: Theory, Research, and Models: Volume II: Solving Instructional Design Problems, 341.

Sites and Resources of Interest

- Modified Job Task Analysis (MJTA). US Department of Labor, Mine Safety and Health Administration – MSHA:

  http://www.msha.gov/interactivetraining/tasktraining/home_intro.html

- Developing Skilled Workers: How-to Guide for Educators, Job Analysis Sample Power Point. Manufacturing Institute, Tools and Resources for Educators

  http://www.themanufacturinginstitute.org/Skills-Certification/Educator-Resources/Tools-and-Resources.aspx?p=2

TOOL 3-3 INSTRUCTIONAL DELIVERY FRAMEWORK

Type of Tool: Worksheet, planning matrix

Summary: This tool is designed to facilitate development of an instructional plan that determines what skills will be taught and where, what activities will be carried out, and what assessments may be needed.

Why: Work-based courses are in essence a varied delivery model, and this tool provides the framework for developing all course content and instructional methods. This step is crucial to developing a true work-based course.

Who Should Use this Tool: Faculty members, employer supervisors and mentors, deans

Spotlight on OCTC: According to Dean Autry, Associate Dean at OCTC, this step of the design process is essential to ensuring the academic rigor of work-based courses:

> The biggest part of figuring out what you can teach by the faculty and by the workplace is you have to meet with the supervisor, and you have to look and see what they have in their plant, what they're doing...We look and see what things they can do on-site and what we also feel comfortable in getting checked off on site. We want to make sure that, first of all, if the supervisor checks off on a task or the faculty checks off on a task, we make sure that it is something they can do by themselves. It's very important as an educational institution your quality does not change. Your quality stays the same. Your expectations for your students stay the same.

GENERAL FRAMING QUESTIONS

1. What is the capacity of both learning sites (college and workplace) to deliver this instruction?

    - What are the staffing and scheduling considerations (number of instructors, "relief" or adjunct faculty or supervisors, flexibility of course schedules, availability of space, etc.)?

2. How will shift considerations and production schedules be taken into account for worksite delivery? Are there natural segments embedded in the workflow that can be adapted for instruction (mini-semesters, trimesters, co-op scheduling)?

3. What physical conditions exist for each delivery option?

    - Where will the classroom instruction take place? Is there currently a separation between lecture and lab?

    - Where will the worksite instruction take place? Is the instruction separate or integrated with the larger work environment?

    - If you are interested in an online learning component, what distance-learning technology (software, basic skills development, etc.) is available at both college and worksite locations? What support infrastructure is available (technical assistance, IT, tutors/coaches, etc.)?

4. What are the material considerations for this course content? Are there variables in machines or tools from classroom to worksite? How do these differences factor into instruction?

5. What are employers specifically seeking from this mixed delivery system? Have they identified specific goals for worksite instruction (efficiency, safety, accuracy, work quality, etc.)?

INSTRUCTIONAL DELIVERY QUESTIONS

These questions are intended primarily for existing courses being adapted to a work-based delivery, rather than for the development of entirely new work-based courses. However, for new courses, you can examine similar manufacturing courses to gain insight into your options for work-based, lab, classroom, and online learning.

1. What course content is currently delivered in college labs? Is the equipment similar to area employer tools and resources?

2. What course content, if any, is delivered via online learning management system or distance learning? How are these aspects integrated with classroom work and labs?

3. At first glance, what lessons, modules, or units of instruction lend themselves most easily to work-based learning?

4. Are there computers available at the worksite? Are they accessible to workers?

INSTRUCTIONAL DELIVERY MATRIX

This chart outlines basic considerations for delivery methods, student engagement, and resource use. The list is meant to guide work-based course teams as they design their content for delivery in multiple sites, focusing on the workplace.

Method	Time/Schedule Considerations	Common Availability of Resources	Student Engagement Level
Work-Based Demonstration	• Production time constraints • Efficient use of supervisor time	• Readily available as required in regular business operations • Ample opportunity through observation of regular business practices • Limited safety concerns • Strong correlation to learning objectives/work environment	Medium
Work-Based Practice	• Requires time for trial and error • Production time constraints	• Readily available as required in regular business operations • Moderate to high concerns about resource use and cost efficiency • Moderate safety concerns • Strong correlation to learning objectives/work environment	High
Classroom: Instructor Demonstration	• Low level production constraints • Efficient use of classroom instructor role • Classroom lab capacity constraints	• Readily available at the community college • Ample opportunity, equivalent to traditional courses • Limited safety concerns • Moderate correlation to learning objectives/work environment	Medium
Classroom: Lecture	• Low level of production constraints • Efficient use of instructor role	• Readily available at the community college • Ample opportunity, equivalent to traditional courses • No safety concerns • Low correlation to learning objectives/work environment	Low

Table continues on next page.

Method	Time/Schedule Considerations	Common Availability of Resources	Student Engagement Level
Online: Self-Paced	• Limited time constraints • Efficient use of worker	• Potential limited availability of personal computers and internet access • Potential limited availability of learning resources appropriate for online learning • Low correlation to work environment	High
Online: Facilitated Synchronous	• Moderate time constraints/ considerations • Moderate use of worker time	• Potential limited availability of personal computers and internet access • Low correlation to work environment	Medium

INSTRUCTIONAL DELIVERY PLANNING WORKSHEET

This worksheet allows course designers to weigh the delivery options for each competency within a work-based course. By considering what would be required and gained by teaching each competency in a worksite, classroom, or online format, faculty and other course designers can map out the delivery modes across the course in a coordinated way that maximizes work-based learning while remaining feasible. For each competency identified in Tool 3-2 or other performance objectives within the course, complete the worksheet to determine how it would be taught in each delivery environment—what would teaching activities look like, what materials would be required, and how would learning be assessed? The final column provides an opportunity to weigh the benefits and challenges of using each delivery mode to teach a specific competency.

Course Content Task or performance objective	**Delivery Environment** How could this be delivered?	**Current College Delivery** How does the college deliver this now (worksite, classroom, or online)?	**Instructional Method** Lecture? Lab Demo? Practice?	**Instructor Type and Availability**	**Activities** What will students do?	**Equipment or Materials** What will students use?	**Assessment Activities** How will learning be measured or captured?	**Summary of Benefit for Environment** What are the pros and cons of this delivery environment?
1. Task/ Performance Objective: **(What should students be able to do? What is the task?)** _____ _____	Worksite			Supervisor				
	Classroom			College Instructor				
	Online			Tutor or Coach? Self-directed?				
Delivery mode chosen and summary of why:								

Table continues on next page.

Course Content Task or performance objective	**Delivery Environment** How could this be delivered?	**Current College Delivery** How does the college deliver this now (worksite, classroom, or online)?	**Instructional Method** Lecture? Lab Demo? Practice?	**Instructor Type and Availability**	**Activities** What will students do?	**Equipment or Materials** What will students use?	**Assessment Activities** How will learning be measured or captured?	**Summary of Benefit for Environment** What are the pros and cons of this delivery environment?
2. Task/ Performance Objective: **(What should students be able to do?)** _____ _____	Worksite			Supervisor				
	Classroom			College Instructor				
	Online			Tutor? Self-directed?				
Delivery mode chosen and summary of why:								

Table continues on next page.

Course Content Task or performance objective	**Delivery Environment** How could this be delivered?	**Current College Delivery** How does the college deliver this now (worksite, classroom, or online)?	**Instructional Method** Lecture? Lab Demo? Practice?	**Instructor Type and Availability**	**Activities** What will students do?	**Equipment or Materials** What will students use?	**Assessment Activities** How will learning be measured or captured?	**Summary of Benefit for Environment** What are the pros and cons of this delivery environment?
3. Task/ Performance Objective: **(What should students be able to do?)** _____ _____	Worksite			Supervisor				
	Classroom			College Instructor				
	Online			Tutor? Self-directed?				
Delivery mode chosen and summary of why:								

TOOL 3-4 ASSESSING WORK-BASED LEARNING

Type of Tool: Templates, guiding questions, and recommendations

Summary: This tool details how to plan, develop, and implement assessment for work-based learning. Tools in this section are designed to assist colleges and employers in organizing and documenting learning in both the classroom and the worksite.

Why: Assessment of learning in multiple contexts is crucial to the work-based course model. The transferability of learning objectives from work to classroom is reinforced by a robust assessment strategy that allows multiple partners to document student skill gains. These tools are designed to foster greater collaboration and communication between faculty and employer supervisors or mentors so that assessment is informed by both parties and reflects learning at both sites.

Who Should Use this Tool: Faculty members and employer supervisors or mentors

Spotlight on OCTC: At OCTC, assessment was conducted in a number of ways, with employer supervisors or mentors conveying information about what a student needed to learn or perfect, and faculty members communicating when a student had demonstrated proficiency in the classroom.

TYPES OF ASSESSMENT

For work-based courses, a portfolio approach to assessment can allow for multiple partners to weigh in on student progress and performance. As instruction is spread across multiple sites, each partner is asked to contribute assessment instruments that demonstrate student progress and mastery of content. Portfolios should have a mix of formative (assessments for learning and development) and summative (assessments of learning and mastery). Examples can include:

Formative

- Textbook assignments
- Written material
- Project rubrics
- Class or work notes
- Self-reviews
- Employee performance review records and attendance

Summative

- Standardized tests (entrance exams, credentialing, and benchmarking instruments)
- Completed work task lists and production goal tracking

Portfolio Content

College Faculty Contributions

- Entry exams, standardized tests
- Textbook assignments, worksheets, completed materials
- Online materials and assessments
- Worksite observation notes

Employer Supervisors' Contributions

- Documentation (work logs, task lists)
- Employer work records (attendance, performance)
- Rubrics and work samples

Each instructional site should contribute material, and close communication (scheduled check-ins and written documentation) is essential to ensure alignment with both learning and production/work goals. If possible, college faculty should visit the workplace to observe student worker performance at regularly scheduled intervals (up to two times for a single work-based course) to document how learning is applied and to check for successful learning transfer. A "master" task list should be shared between college faculty and employer partners to ensure students are demonstrating skills and abilities at both instructional sites, and regular contact and course notes can ensure that mastery is being developed.

ASSESSMENT TEMPLATE

Week (Date)	College Faculty Notes	Employer Supervisor Notes

ON THE JOB PERFORMANCE RUBRIC (SAMPLE)

Objective or Task	Definition of Mastery Determined jointly by college and employer	Emerging Evidence of partial ability and progress	Developing Evidence of developing ability and progress	Proficient Evidence of adequate ability	Exemplary Strong evidence of mastery

MASTER TASK COMPLETION LIST

Student_____

Course_____

Module_____

Task	Competencies	Notes	College Faculty (date)	Employer Supervisor (date)
	1. 2. 3.			
	1. 2. 3.			
	1. 2. 3.			
	1. 2. 3.			
	1. 2. 3.			
	1. 2. 3.			
	1. 2. 3.			

TOOL 3-5: ASSEMBLING YOUR COHORT MODEL

Type of Tool: Action Guide

Summary: There are a number of considerations when designing instruction for a work-based learning program; chief among them are multisite delivery (work and classroom based) and cohort compilation. This tool offers guiding considerations as a college assembles each cohort for a specific work-based course. First, it poses questions to determine whether a single or mixed employer cohort is more realistic for the college and employer partners. Second, it frames key issues that emerge for each form of cohort composition across a range of work-based course delivery elements: number of students in the cohort; scheduling; instructor and supervisor roles; and course content, materials, and site considerations.

Why: Depending on the number of employers engaged, the scheduling and production cycles of varying sites, and the general skill needs of an industry, the cohort model compilation can greatly influence program design. Program designers should think through the implications of specific cohort models before beginning a work-based course so that instructors are not stretched too thin or attempting to balance too many differing expectations across employers. The considerations raised in this tool relate to basic issues that will need to be considered for a successful work-based course cohort, even after the competencies and overall design of a work-based course have been determined.

Who Should Use this Tool: Program administrators, work-based course faculty

Spotlight on OCTC: When OCTC began to develop its work-based course program, the program administrators expected that major employers would each enroll a cohort of students roughly equivalent to the size of a traditional manufacturing class. Instead, they found that companies could not fill a cohort of that scale without impacting their production line too greatly. Instead, OCTC has worked with employers to build three types of cohorts, each made possible in different ways.

First, OCTC offered employers single employer work-based courses but with reduced size cohorts. A state training fund to support community college training for companies, KCTCS-TRAINS, pays for the additional faculty cost for this design. They have found that companies appreciate the degree to which the delivery of these courses can be customized to their needs, maximizing the flexibility available within an existing academic course.

The second type of cohort offered by OCTC is a small consortium approach in which two or three employers join together to train their incumbent workers. As with the single employer cohorts, the class size is smaller than in a traditional class, with KCTCS-TRAINS supporting the additional instructor costs. With only a few employers involved, it is easier for instructors to coordinate and continue to meet the particular needs of each company. Work-based course students have expressed the benefits of learning from each other how the knowledge they gain in the courses looks on the job in different environments.

Most recently, OCTC has brought together over a dozen manufacturers to provide consortium work-based course cohorts that are the same size as traditional manufacturing courses. Through GO FAME (Greater Owensboro Federation for Advanced Manufacturing Education), part of a statewide manufacturing program to pair classroom instruction with on-the-job training, employers hire workers who also participate in a suite of work-based courses that stack into an associate's degree. In Owensboro, each company has typically hired one or two workers to participate and employers jointly identified common gaps in their talent pipeline to guide the program design. Because work-based course students are new to the companies rather than incumbent workers with varying degrees of experience and skills, the educational needs have been compatible across companies. OCTC has used courses they had already adapted to a work-based delivery format as the core of their GO FAME program.

ONE EMPLOYER OR MORE?

Many aspects of work-based course design will depend on the employers engaged. The first step in answering this question for a specific cohort is to determine if a single employer has sufficient capacity for its own cohort, or if multiple employers need to come together to provide a sufficient number of students. Several questions can help determine which of these options will work best for the employers and college:

How flexible is the college?

- What is the minimum number of students required per class at your college?
- Do your work-based courses need to enroll as many students per course as a traditional class, or do you have alternative forms of resources to supplement instructor time and other course costs?
- Does the college have resources for instructors to spend extra time within a course coordinating among multiple employers?
- What is the level of commitment the college will require from each employer to engage in a work-based course program?

Is a single employer cohort possible?

- For smaller employers, how many students will be available at a given time?
- For larger employers, how many students will be available with similar needs or at entry points of employment?
- Are there ample workers to fill production gaps when workers are learning?
- Does the company's training budget or policies limit the number of workers who can enroll in work-based courses at the same time?

Is a mixed employer cohort possible?

- Would the employers who are interested in providing work-based courses be open to collaboration with other employers?
- How many workers can be served through a work-based course through a compilation of employers from local industry?
- Are there similarities across employers about what technical skills workers currently possess, and what they are lacking?
- What are the selection criteria that employers plan to use for workers to enroll in work-based courses? Are employers interested in enrolling newer, entry-level workers, or more seasoned, proven veterans? Is this likely to lead to a cohort of work-based course students with similar educational needs?

CONSIDERATIONS FOR COHORT COMPOSITION

Once you have determined whether a single employer cohort or mixed employer cohort works best for your employer partners, the cohort type will inform the design of the work-based course itself. In addition, the considerations in this matrix can guide an evaluation of the feasibility of the course itself.

If there is a single employer engaged, the questions surrounding cohort compilation are typically centered on scheduling and capacity constraints (for both work-based course students and supervisors), identifying specific skills gaps and work quality concerns, and clarifying career advancement opportunities. When engaging several industry employers, questions of scheduling become more involved, as do compatibility of the skills training needs, supervisor training, and career advancement opportunity structures. For example, for a mixed employer cohort, how does the variation in technology available across companies impact the ability to teach the same competencies in a work-based format rather than in a lab or classroom?

Cohort type	Number of Students	Scheduling	Instructor and Supervisor Roles	Course Content, Materials, and Site Accommodations
Single Employer	Does the number of students available through this employer meet the minimum requirements for the college?	• How can the course accommodate shift variations within a site? Can you schedule for workers who work second or third shift, or create ways to relieve pressure on a single shift? • Has the company identified time for demo/practice?	• How many suitable mentors are available? • What kinds of incentives can the company provide for its supervisors?	• Is there consistency of equipment from work to classroom? • Does the company have the necessary technology, materials, and tools available for efficient use within the course?
Mixed Employer	How will the cohort balance the presence of workers from multiple companies? Is there a cap on workers from each site?	• How can the course accommodate shift variations and production schedules at varying sites? • Will supervisors and mentors be similarly available across sites? • How will multiple companies provide compatible time away from work activities?	• What is the college's strategy for training and orienting staff from multiple sites? • How will the instructor work with varying levels of employer accommodations? • How will the different kinds of incentives for supervisors impact learning across the cohort?	• How does varying company equipment impact what can be taught on the job for each company? • Do companies have varying levels of on-the- job learning resources accessible to their workers? • What are the varying employer goals for program participation? • Can a single cohort meet cross-employer skill needs?

SECTION 4: TRAINING EMPLOYER SUPERVISORS AND

MENTORS

AS A PEER MENTOR, ONE PIECE OF MY ACCOUNTABILITY IS NOT ONLY TRANSFERRING THAT KNOWLEDGE, BUT MAKING SURE I UNDERSTAND WHEN THEY NEED TO MOVE TO THE NEXT STEP

- Tim Sheldon, Organizational Effectiveness Specialist, Kimberly-Clark

Work-based courses require college faculty, employer supervisors or mentors, and students to stretch beyond their usual roles. College faculty are asked to co-design curricula, draw on relationships or knowledge of industry and area employers, and train employers to teach. Students are asked to work, study, and apply information and skills in multiple contexts. Employer supervisors and mentors are asked to teach while they work, mentoring their colleagues as they simultaneously perform work tasks. All these role shifts are significant and require thoughtful preparation and, often, training. Work-based courses and the new roles they entail offer a chance for all stakeholders to broaden their skills and perspectives in a way that builds relationships and reinforces learning within and beyond the courses themselves.

Employer supervisors are key to the success of a work-based course program because they add a new dimension to the learning process. Serving the dual role as employee and teacher, the supervisor must draw on a number of different strengths to best provide instructional support. Colleges should implement training, delivered by faculty, that encourages supervisors to participate as part of the instructional team and assists them in developing the skills they need to facilitate and document learning.

This training should draw on the strengths of expert employees and be situated in the manufacturing context. Section Four tools include materials aimed at helping colleges present supervisor training through a series of presentations and discussion prompts, and a train-the-trainer overlay for college faculty.

CREATING A CULTURE OF LEARNING

In a manufacturing setting, there are multiple opportunities for learning. Although time and production constraints can seem to impede drawing out "teachable moments" in the midst of work tasks, thinking of learning opportunities can be a productive way to skill up a company's workforce. Supervisors can learn to recognize these opportunities and be given strategies to use them as reflective exercises that increase the student's knowledge and ability. In many instances, recognizing and using teachable moments will require the supervisor to provide feedback about performance, or use prompts as students perform a particular task. These strategies provoke reflection and metacognition, which lead to deeper understanding and better troubleshooting skills. Similarly, college faculty can use feedback or written communication from supervisor about particular incidents as classroom case studies to delve deeper into how a task is carried out, troubleshoot a problem, or reflect on what could have been done differently. This continued reference to real world, lived contexts allows students to make better connections to concepts and processes and encourages continued communication and skill development on the job.

An effective and empowered supervisor has the ability not only to instruct students, but also to foster a sense of ownership among other employees. Often, this happens organically in the workplace, with more senior, experienced operators or supervisors relaying advice, knowledge, or demonstrations of expert work. For work-based courses, the process becomes more explicit so that learning can be documented and assessed.

This culture of learning can reinforce a number of positive work behaviors, and many companies report that training their own workforce in this manner can help with employee retention and satisfaction and lead to higher production quality and less downtime. Work-based courses aim to aid area industry in developing and retaining talent and to help students gain knowledge and skills to further their education and career goals. Ultimately, both goals are supported by engaged, trained supervisors who provide the guidance to foster learning in the workplace.

DEVELOPING EFFECTIVE SUPERVISORS

> "Typically, our peer mentors are senior people on the line...And those are the people we kind of rely on to train our new hires as they come in...So our peer mentors are senior people [with] a lot of knowledge, a lot of experience, and they also have good people skills. So they can talk to somebody. They understand that there's going to be questions. They don't have a high level of frustration around that."
>
> – Tim Sheldon, Organizational Effectiveness Specialist, Kimberly-Clark

The first step to developing effective supervisors or expert mentors is identifying existing employees with the right mix of temperament, expertise, and willingness. Lewis Nall, OCTC faculty member, notes that,

> "the best supervisors are ones that are similar to a teacher. They're willing to teach. They're willing to work with that employee and help them to be better, whatever that may be."

Often, these individuals are already in positions that require some instruction or coaching, however informal. A college can assist in this process by working with companies to outline the qualities necessary for optimal instruction in the workplace, and faculty with manufacturing sector experience should be prominently featured in these discussions.

A good supervisor is able to use teachable moments, give feedback, and facilitate the worker's understanding of the production process. In some cases, faculty can work on-site with new supervisors to coach them and provide them strategies for demonstrating tasks, documenting student progress, and providing constructive feedback. Additionally, communication between faculty and supervisors is essential throughout the program, with faculty often acting as coaches for both the student and the supervisor. In a work-based course setting, this communication and feedback loop assures that development of all parties is supported and strengthened. It also provides positive reinforcement both to the student and the supervisor.

The tools in this section form a facilitator's guide for faculty to train supervisors for their role in delivering work-based courses. The section begins with a tool designed to assess a variety of training formats and consider which best meets the needs and availability of employer supervisors. The other tools walk through designing and delivering the training workshop and provide slides and handouts for the training itself. The training presentations are divided into four parts: orienting employer supervisors to work-based courses; designing a work-based course approach; instructional strategies for work-based courses; and assessing work-based learning.

TOOL 4-1: SUPERVISOR TRAINING FORMATS

Type of Tool: Tip sheet

Summary: Just as work-based courses adapt their delivery format to the needs of an employer, the training to deliver work-based courses should also meet the needs of participating employer partners. This tool provides questions and suggestions for determining how to deliver supervisor training. Ideas for training formats highlighted here include a single workshop, a series of abbreviated workshops, faculty shadowing supervisors, or an online course.

Why: While training is critical to equip supervisors to succeed in their role as instructors, it can be difficult for employers to make their staff available for the training. If the training format is too rigid, supervisors might not complete the training and will miss opportunities to effectively facilitate learning on the job. Providing multiple forms of supervisor training could also allow staff to access a refresher course or other resources that will build their teaching skills through the work-based course.

Who Should Use this Tool: Program administrators, faculty members

Spotlight on OCTC: When OCTC launched its work-based course program, employer partners participated in in-person workshops that piloted work-based supervisor training strategies. These manufacturers also requested a flexible, hybrid training that included online components to accommodate time constraints and the varied learning levels of the participants. OCTC learned that flexibility in how the employer supervisor training is provided helps maximize their preparation to demonstrate and reinforces effective strategies to teach and document worker learning.

CONSIDER A VARIETY OF TRAINING FORMATS

While training is critical to supervisors' success in their role as instructors, it can be difficult for employers to make their staff available for training. Be prepared to adapt the one-day training to other formats that both respond to an employer's logistical needs and provide the supervisors with strong professional development opportunities. Consider these tips as you adapt your training to a format that works for all your partners:

Sometimes the format will be driven by logistical constraints

- How many supervisors will be required to attend the training, and how do their production responsibilities intersect?
- Can the training be offered during a slow period in the production cycle when many of the supervisors can be available for a full day?
- Does it take a long time to travel between the plant and the college, making multiple trips difficult?
- Can shorter meetings be scheduled around the supervisor's shift schedule to minimize their time away from work? Are you training supervisors who work different shifts?
- Will the training be offered to supervisors within a single company, or will you be bringing together multiple employers?

Consider the design benefits of different training formats

The supervisor training must respond not only to employer schedules, but to the learning needs of the supervisors based on their on-the-job teaching expertise. Past relevant experience could include providing formal apprenticeship instruction, training other employees in company procedures and technical skills, or mentoring new employees. Supervisors who have more of these types of experience mentoring other workers may not need as much guidance in identifying learning opportunities. A shorter training can serve as a refresher or focus on connecting that instruction to the formal work-based course. Supervisors may be less comfortable relating the practical, hands-on training within their work responsibilities to academic concepts or curricula. Supervisors who have not had as much experience with on-the-job teaching could benefit from more thorough training, with opportunities to engage in role playing, practice learning strategies presented in trainings, and reflect with faculty on what they are learning.

Format Options

This table outlines the advantages and challenges of common training formats, reflecting both the logistical and instructional needs of employer partners.

	Advantages	Challenges
In-person workshop: 1 day	Supervisors can benefit from the most in-depth opportunity to learn through hands-on training and practice role playing. Particularly valuable for supervisors with little experience in instruction and teaching.	Completing the training in one session provides less opportunity for reflection and to ask the trainer questions that emerge after some reflection.
In-person series of short sessions	Offers many of the same benefits as the one-day workshop without requiring supervisors to miss a full day of work. It also gives supervisors time to reflect or complete assignments between sessions.	Each session is an opportunity for production needs to take priority over the training. Supervisors are more likely to begin but not complete training due to these disruptions.
Faculty member shadows supervisor	Faculty shadowing supervisors can customize the lessons to the experiences of each supervisor and most closely echo what will happen in the course. The training can also establish the relationship between the supervisor and faculty that will be important throughout the course delivery.	This approach is time intensive for the college faculty, particularly if numerous supervisors require training at the same time. Supervisors may be distracted as they work. In addition, supervisors miss the opportunity to learn from one another.
Online course	Can serve as a refresher for supervisors with instructional experience. An online course can also convey what the work-based model is for supervisors not yet familiar with the expectations of their role.	This is the least interactive format, making it difficult to adapt lesson content based on the particular company context. For those unfamiliar with many of the instructional strategies presented, it is more difficult to ask questions and role-play or practice.

4-2: PLANNING SUPERVISOR TRAINING

Type of Tool: Planning guide, worksheet, sample agenda

Summary: Training employer supervisors is a crucial component of the work-based course model. This facilitator's guide is designed to assist college faculty teams as they design a training workshop for supervisors, adapt resources, and facilitate collaboration between the college and local manufacturing industry. This planning tool should be used in combination with the other tools from Section Four.

Why: For successful training, a team approach works best. Team members should include faculty, college leadership (for high-level support), administrative or clerical support, and industry liaisons. The tools and resources below are meant to guide training development and should be used in conjunction with other faculty-developed materials and college resources.

Who Should Use this Tool: Faculty members

Spotlight on OCTC: OCTC began work-based course development with the assumption that employers would need significant training in order to teach adult learners at their worksites. The work-based course team considered various strategies for training worksite supervisors and mentors on instructional and competency assessment techniques. OCTC discovered that their manufacturing employer partners had for the most part designated and trained their "best and brightest" supervisors to serve as instructors. These instructors were doing a respectable job of providing the on-the-job training that was already occurring. In fact, most of these supervisors had college credentials and years of proven work experience to add to their dossiers. At the same time, an impressive work record or college degree does not guarantee an effective teacher. Some of the highest-performing workers in the plant were not able to communicate expectations or teach critical job skills to others. In addition, coordinating with faculty to teach and assess the specific competencies expected in a college-level course required different skills and activities from these workplace mentors.

This training has developed supervisors that students recognize as educators as well:

> I feel like my supervisor's not in a managerial role but more of a mentor role. That's what I really like about how the program is structured, is that we can have a well-suited mentor that could walk with us through learning about the job while we're on the site.
>
> – Corey Marchand, work-based course student at OCTC and employee at OMICO Plastics

PREPARE YOUR TRAINING

Careful planning and preparation are important to the success of your training. Use the steps below as a general g uide.

Set the time and place

Just as employer constraints influence the selection of a training format in Tool 4-1, the time (or times) and location for your training should be responsive to employer needs. Determine a convenient location at the workplace, on the college campus, or in any other space available to both parties. It is important to have a space that is mutually agreed upon and comfortable, so choose a space that can be booked in advance with minimal distractions. Also, timing of the training needs to be agreed upon well in advance, as both faculty trainers and employer supervisors are busy people. This may require early morning or late evening sessions to accommodate shift changes.

Identify facilitators

Determine who will facilitate/co-facilitate. Faculty with an industry background and the most experience in training industry are a good choice, and other faculty or deans who have experience teaching can act as co-facilitators and designers. Ideally, there should be a main facilitator with up to three other co-facilitators to work with small groups and support the training overall.

Convene a planning team of facilitators, co-facilitators, and any other support staff that will be involved in the training. Advance planning will allow you to assign roles and responsibilities, including both training tasks and logistics and support duties.

Do your homework

Gather information about your training participants, including which companies will be sending supervisors or other expert mentors, who from those companies will be attending, and any other pertinent information that will allow you to customize your training content.

Review workshop materials included in this toolkit and identify needed changes to content, layout, and medium. Prepare materials at least two weeks in advance to keep last-minute changes to a minimum and be sure that all training facilitators are comfortable in their assigned roles. Also, gather materials from companies, including task lists and other production documents that will be used as reference materials. Some companies will want to scrub documents for proprietary information. The college can assist in this process and allow company representatives to approve the documents before training.

Prepare your space, whether it is physical space or a virtual platform. If it is physical, visit the room and check out any assistive technology (projectors or others) and determine how to arrange seating. If it is virtual, do a test run to determine if all technology is ready and operators are comfortable with it.

TRAINING READINESS CHECKLIST

Working with the college training team, this checklist will help you prepare and be ready to train. Use the Notes section to assign duties, note necessary steps to completion, and keep track of unresolved questions.

Complete?	Tasks	Notes
	Determine the time and location for your training	
	Determine who will facilitate/ co-facilitate	
	Convene a planning team	
	Gather information about your training participants	
	Review workshop materials	
	Revise workshop materials	
	Prepare your space and check technology	

DESIGN YOUR AGENDA

When designing your training schedule and agenda, take into account the time available to both faculty trainers and supervisors. The training set out here is highly customizable, but should not be significantly shortened or abridged. Supervisors must be trained on the model in order to successfully contribute and feel comfortable with their expanded roles as part of a rigorous academic course. In customizing the training, faculty trainers should seek to create tighter linkages to specific work conditions, without sacrificing the need for supervisor learning.

There are a number of ways to deliver training, and colleges should feel empowered to design their workshop in a way that serves their college and local industry best. Below are two examples of training formats and agendas.

Sample agenda: In-person, three-quarter day long training.

8:00 am – 8:15 am	Welcome, Introductions, and Goals of the Training
8:15 am – 8:45 am	What are Work-Based Courses? • Overview of work-based course model • Benefits to workers and industry
8:45 am – 9:30 am	The Workplace as Classroom: Linking Experiential Learning with College • Work-based courses and the adult learner • Harnessing the workplace as a learning lab
9:30 am – 9:45 am	Break
9:45 am – 10:30 am	Designing a Work-Based Course • Crafting learning objectives for the workplace • Collaborating with college faculty and staff • Balancing work demands and student coaching
10:30 am – 11:45 am	Instructional Strategies for the Workplace • Overview of work-based instruction • Strategies for making learning explicit and "real" • Incorporating classroom knowledge with workplace skills
11:45 am – 12:45 pm	Lunch
12:45 pm – 1:45 pm	Documenting and Assessing Work-Based Learning • Using workplace task lists and competency checklists as assessments • Strategies for documenting progress and skill
1:45 pm – 2:15 pm	Faculty Roundtable • College faculty share their experiences with work-based courses and customized training and ask for feedback from participants.
2:15 pm – 2:30 pm	Wrap up and adjourn

Sample agenda: Blended training, with some pre-work delivered virtually and some delivered in person.

Format	Topic	Date/Time/Duration
Webinar (asynchronous)	What are Work-Based Courses	1 hour, recorded pre-training
Webinar (synchronous)	Designing a Work-Based Course Program	1 hour, 3 pm – 4 pm
In-person training	The Workplace as Classroom: Linking Experiential Learning with College	2 hours, 5 pm – 7 pm
In-person training	Instructional Strategies for the Workplace	1½ hours, 5 pm – 6:30 pm Wednesday
In-person training	Documenting and Assessing Work-Based Courses	1½ hours 5 pm – 6:30 pm Thursday
Webinar (synchronous)	Wrap-up, reflections, training feedback	45 minutes, 10:00 am Saturday

TOOL 4-3: DELIVERING THE TRAINING

Type of Tool: Tips and note-taking template

Summary: This tool provides descriptions of various facilitation formats and strategies for bolstering participation. The discussion strategies and note sheets can help faculty members organize their training workshops and should be adapted by faculty trainers based on feedback and ideas submitted by company representatives. These should be used in combination with the other tools from Section Four.

Why: Many of the tips included here may be familiar to faculty members with experience designing and conducting train-the-trainer workshops. For those who have not led these types of workshops, or could benefit from a refresher, these tips are a useful reference.

Who Should Use this Tool: Faculty members

> When you're speaking to somebody and you can see in their eyes they're lost, but something that you say or do triggers that spark where you can literally look into a person's eyes and you see them saying "ah-ha" to themselves. They get it. That's what we want our supervisors to be, okay? To be that in tune to where the employee is deficient and what they need to do in order to level up and close the gap.
>
> - Donald Wooldridge, Aleris

GENERAL TIPS FOR DELIVERING TRAINING

Be well prepared, but flexible. While trainers will want to be prepared and ready for training, it is important to remember that flexibility and comfort with training materials are key. In all trainings there is potential for something to go wrong, and being flexible and relaxed can allow trainers to overcome small snags.

Adapt to the audience, but stay true to the training goals. If your participants are interested in the topic, or have more or less knowledge of the area than you expected, don't hesitate to tweak content as you train. However, anchoring your training to the core objectives you set out will help you deliver a successful training.

Facilitate conversations and dialogue, but don't be afraid to table something. If the conversation veers off too much, if participants are negative or distracting, or if there are questions that surface that you simply can't answer, don't hesitate to leave topics on a "parking lot" or some other list. This will indicate that you will return to them later with more information, but for now you are moving on.

Be respectful. Remember, participants are coming to the training to learn something new, so patience and listening skills are key. Also, participants bring their own knowledge and experience to the training, so remember to harness that and learn along the way.

STRATEGIES TO PROMOTE INTERACTION AND DISCUSSION

Delivering the training is equal parts relaying information and promoting collaboration and discussion. Discussion questions are featured prominently in many parts of the training, and they are designed to spur interest, understanding, and ownership of the work-based course model. Below are some strategies and tips for using discussion questions.

Think-Pair-Share

For deeper discussion it can be helpful to have participants pair up and share thoughts or ideas. Generally, a think-pair-share exercise is a quick way to promote interaction within a group. Once pairs have met, have each report back to the group to generate ideas.

Basic format:

- Pose a question
- Have participants think to themselves, considering their answer (around 2 minutes).
- Pair participants.
- Participant pairs discuss and share ideas or suggestions (about 5 minutes).
- Regroup as a whole and get responses from pairs (about 5 minutes).

Group Work/Discussion

Another way to generate discussion in larger groups is to have "table time," where smaller groups (3-6 people) discuss ideas with the aid of written questions and a faculty facilitator. The facilitator's job is to ask questions, prompt participants, take notes, and move the discussion forward in a timely manner. These notes can then serve to inform the larger group and any training materials that follow.

GROUP DISCUSSION QUESTIONS: NOTE-TAKING TEMPLATE

This template can initiate discussion within the workshop. Taking notes on employer responses is critical, because this information can also guide the ongoing collaboration between faculty and supervisors in the work-based course itself, not just the supervisor training. Supervisors and employer mentors can draw on their experiences providing on-the-job instruction other than the work-based course, any involvement they had in the design of the work-based course being launched, or their observations of and interactions with other work-based courses at their company.

Company Name
Roles and titles of employer supervisors and mentors
How does your program fit into training and promotions at your company? If your company has offered other work-based courses, what did they look like?
How did it get started? Did you have a company "champion" who is well versed in the course design?
How does the model work, and who is responsible for what?
Did you participate in the task analysis provided by the college to help your company envision a work-based course? If so, what was particularly useful or illuminating about this process?
How do you determine learning objectives on the job?

Table continues on next page.

How do you balance what the worker needs to know now vs. what he or she should learn in the future?

How do you balance work demands and student learning goals?

What are your goals in implementing a work-based course model?

What are your impressions so far? What are you most excited about? What are your concerns?

How would you describe your expectations for working with your employees in this model?

If you have already begun instruction for a work-based course, has it changed your perspective on your workers, on their potential or future in the company?

How do you coach for performance? How are you “creating your own workforce”?

TOOL 4-4: SUPERVISOR TRAINING HANDOUTS

Type of Tool: Handouts

Summary: These handouts support the supervisor training in several ways: The first two provide learning theory frameworks that can help supervisors understand how to best instruct their workers. The next two worksheets can be used both during the training and throughout a work-based course to structure how a supervisor assesses what work-based course competencies a worker has mastered. The final worksheet allows supervisors to evaluate the training itself so that future supervisor trainings can better prepare supervisors to be effective in their work-based course role. Faculty trainers can adapt these to be distributed as handouts for the employer supervisors during training. They should be used in combination with the other tools from Section Four. Note that the material in these handouts appears on the slides in Tool 4-5.

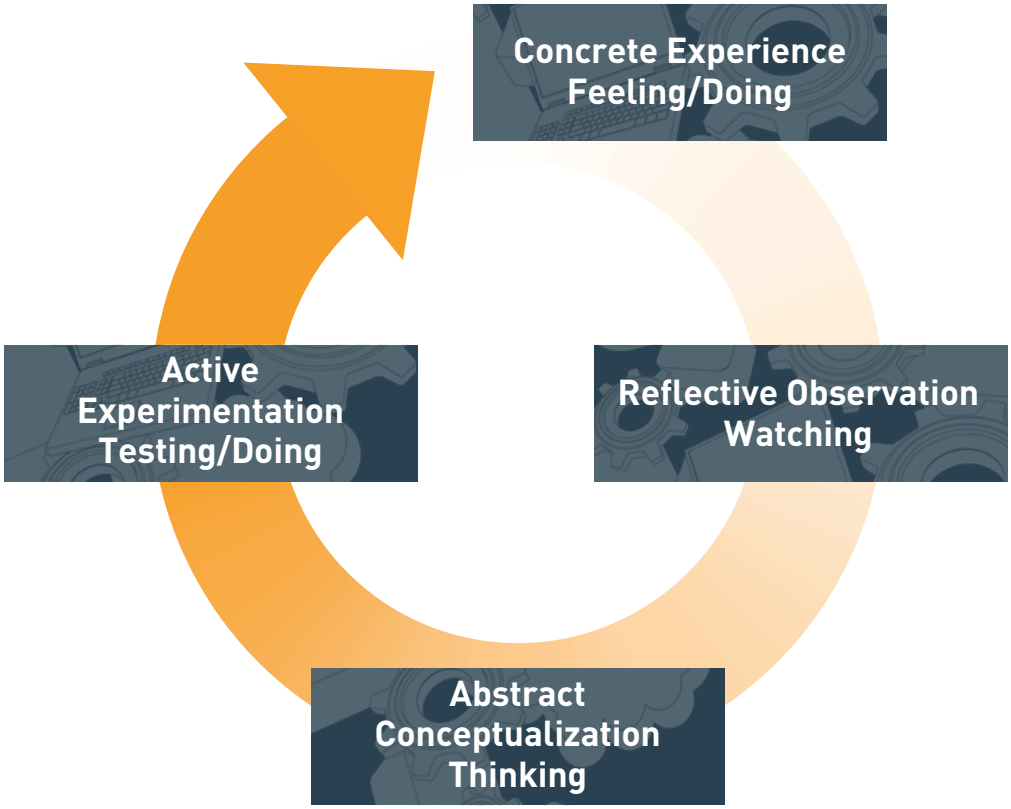
Why: Handouts focus learning from the supervisor training and provide something that supervisors can take with them to guide their instructional role throughout the work-based course. Faculty trainers can add other handouts that will support their collaboration throughout the course.

Who Should Use this Tool: Faculty members

KOLB'S EXPERIENTIAL LEARNING PROCESS

David Kolb is a learning theorist who coined the term "experiential learning." His work focuses on how learners use experiences to drive understanding, knowledge, and skill development.

In this training, we frame work-based courses as experiential learning activities. Experiential learning is a four-step process that starts with the learner (or worker) experiencing or doing something, like performing a work task, then reflecting on the experience by asking critical questions, then analyzing or conceptualizing the experience by connecting it to some known skill or task; and then applying or practicing the skill.



Visual adapted from:

1. Kolb, D. A. (2014). Experiential Learning: *Experience as the Source of Learning and Development*. FT press.

GROW'S STAGES OF LEARNING AUTONOMY

Gerald Grow designed the following matrix to represent the relationship between student learning stages and instructor roles and responsibilities and to illustrate how these roles and tasks shift over time. This framework also illustrates how learning happens along a continuum of experiences and shows how instructional tasks can and should evolve as students become more experienced and autonomous.

Use this matrix as a reference point when discussing how instruction appears on the job and how to scaffold learning from work activities.

Stage	Worker Role	Supervisor/ Teacher Role	Common lesson types or formats
1	Dependent	"the Expert"	Drill or lecture. These lessons tend to be directive in nature.
2	Interested	Motivator, Guide	Lecture and discussion. These activities tend to encourage student engagement and "buy-in."
3	Involved	Facilitator	Discussion, collaborative work, or practice. These activities are generally centered on team-building or guided exploration.
4	Self-Directed	Consultant, Delegate, Supervisor	Individual or group projects or work tasks. These activities tend to be "capstone" experiences that require multiple skills.

Grow, G. O. (1991). "Teaching Learners to be Self-Directed." *Adult Education Quarterly*, 41(3), 125-149.

SAMPLE RUBRICS AND ASSESSMENT TEMPLATES

This is a basic rubric for assessing skills in an individual unit or segment or course. The college instructor and employer should agree on the list of skills and competencies to be assessed. The supervisor will rate the work-based student's demonstrated mastery on the job on a scale of 1 to 3, with 1 being the lowest level of understanding and 3 the highest. The supervisor should sign and date each rating, then give the assessment to the college instructor.

Skills and Competencies	Rating			Date and initial
	1	2	3	
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Rating scale: 1=no evidence of proficiency, 2=emerging evidence of proficiency, 3= proficient/mastery

BASIC ASSESSMENT MATRIX

Complete this handout as part of a guided exercise for assessing work-based learning within a work-based course. The intent of this exercise is to brainstorm various ways to assess skills or competencies both as part of the job and in other ways at the workplace.

Skill or competency	Formative	Interim	Summative
	Self-assessment	*Written assignment or essay*	*Credentialing test or final exam*

BASIC TRAINING EVALUATION TEMPLATE

Please provide feedback on the training workshop so that the college can continue to improve its supervisor training as part of its work-based course program.

What were your overall impressions of the training?

Organization				
5	4	3	2	1
Well Organized				Poorly Organized

Content				
5	4	3	2	1
Very Informative				Not Informative

Usefulness				
5	4	3	2	1
Very Useful				Not Useful

Do you feel this training has increased your knowledge about learning in the workplace?

What session did you find most helpful/interesting and why?

What session did you find least helpful/interesting and why?

What suggestions do you have to improve our training?

TOOL 4-5: SUPERVISOR TRAINING SLIDES

Type of Tool: PowerPoint slides

Summary: The slides at the core of the supervisor training introduce the work-based course model, relevant learning theory, and strategies for promoting learning on the job. Slides for the supervisor training are presented with script suggestions in the notes and discussion prompts. These are to be used as suggestions, and should be customized by faculty trainers. These slides should be formatted and adapted by faculty trainers based on feedback and materials submitted by company representatives. They should be used in combination with the other tools from Section Four.

Why: While many supervisors bring experience in on-the-job training and instruction, they may be less familiar with work-based courses. Other supervisors may not be as comfortable taking responsibility for guiding learning in the workplace. Bringing together supervisors for this training can help them learn from each other and help them connect their training and mentorship expertise to this model.

Who Should Use this Tool: Faculty members

The Powerpoint slides with facilitator notes can be downloaded at:
jff.org/workbasedcourses/

Go to the Toolkit tab, then scroll down to section 4.

TRAIN THE TRAINER: SUPERVISOR ORIENTATION TRAINING

WHAT ARE WORK BASED COURSES?

WORK-BASED COURSES ARE:

RELATED EXPERIENTIAL AND WORK-CENTERED LEARNING MODELS

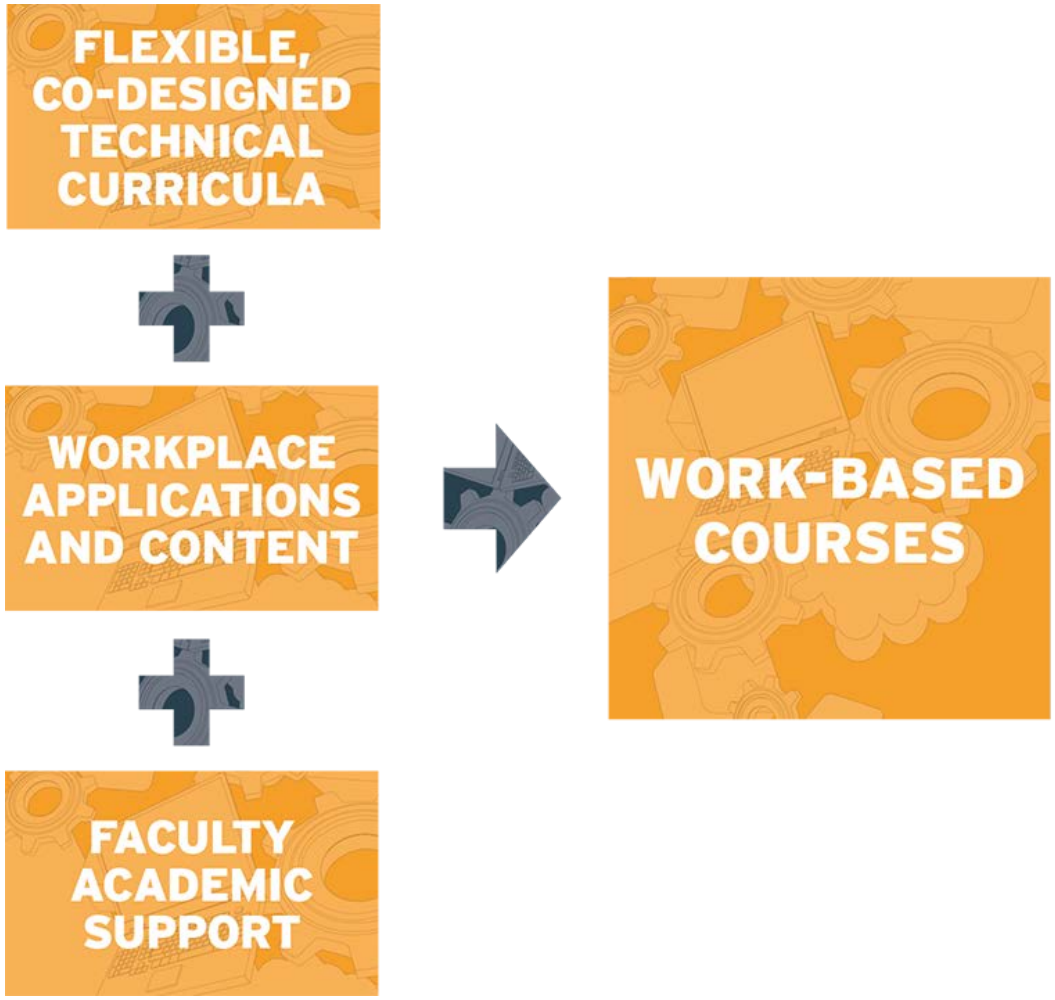
Problem-based learning: Classroom teaching approach that emphasizes practical and hands-on experiences that mimic the workplace

Job Shadowing and Field Trips: As part of a course, employer hosts students to observe workplace and/or employees in relevant occupations

Internship: Student supplements academic coursework with a bounded period of paid or unpaid real-work experience that includes guided learning opportunities provided by employer

On-the-Job Training: Employer provides formalized training that is needed for specific occupations on the job site

Apprenticeship: Combination of formalized workplace learning and classroom learning to develop highly skilled workers


FLEXIBLE, CO-DESIGNED TECHNICAL CURRICULA
WORKPLACE APPLICATIONS AND CONTENT
FACULTY ACADEMIC SUPPORT
WORK-BASED COURSES

- Why Are You Interested in Work-based Courses?

- What Are the Benefits You See in Working With Faculty in This Way?

FOR EMPLOYERS

Workforce trained for your needs; reduced costs and higher productivity; higher worker morale and retention; and direct financial benefits

FOR COLLEGES AND FACULTY

Higher enrollment and revenue; improved student outcomes; opportunities to develop new programs and partnerships and initiate institutional reforms

SUPERVISOR ORIENTATION TRAINING

THE WORKPLACE AS CLASSROOM: LINKING EXPERIENTIAL LEARNING WITH COLLEGE COURSES

JOBS FOR THE FUTURE

TRAINING GOALS

- Overview of adult learning and experiential learning
- Coaching for self-direction and mastery at work
- Using the workplace as a learning lab

Adult Learning Vs. Child Learning

- What Are The Differences?

Learning On The Job Vs. In The Classroom

- What Are The Advantages?

THE ADULT LEARNER

Learning at work is connected to immediate and long-term goals, so adults are more self-directed

- Accomplishing work tasks
- Fulfilling duties as assigned

  AND

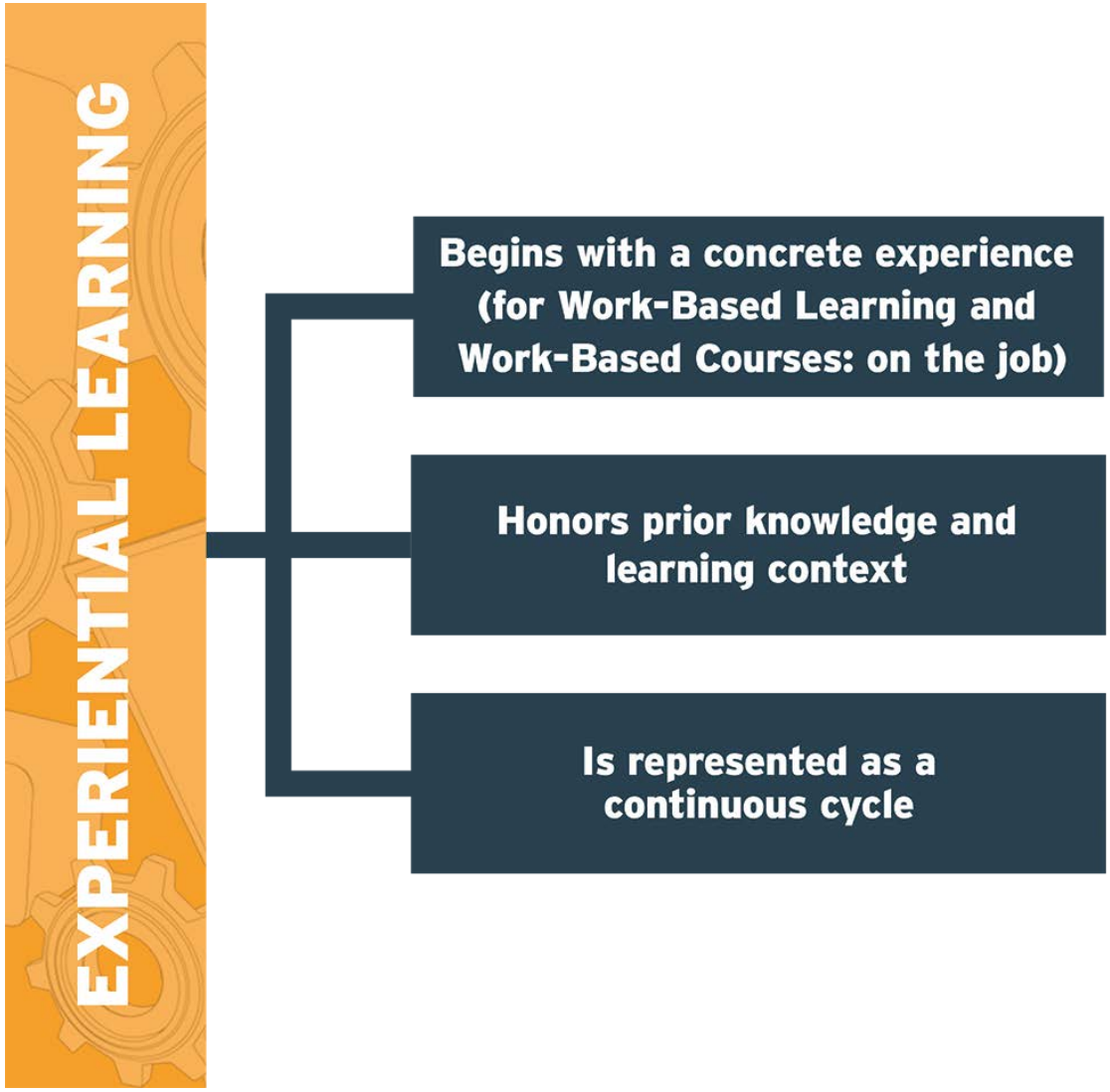
- Establishing future goals (better productivity, work performance evaluations, promotions, etc.)

THE SELF-DIRECTED ADULT LEARNER

GROW'S STAGES IN LEARNING AUTONOMY

Stage	Student	Supervisor/Teacher Role	Examples
1	Dependent	"the Expert"	Drill. Lecture. Directive in nature.
2	Interested	Motivator, Guide	Lecture and discussion. Goal setting.
3	Involved	Facilitator	Discussion and collaborative work. Practice. Team building.
4	Self-Directed	Consultant, Delegate, Supervisor	Individual or group projects. Work tasks.

Grow, G. O. (1991). Teaching learners to be self-directed. Adult education quarterly, 41(3), 125-149.

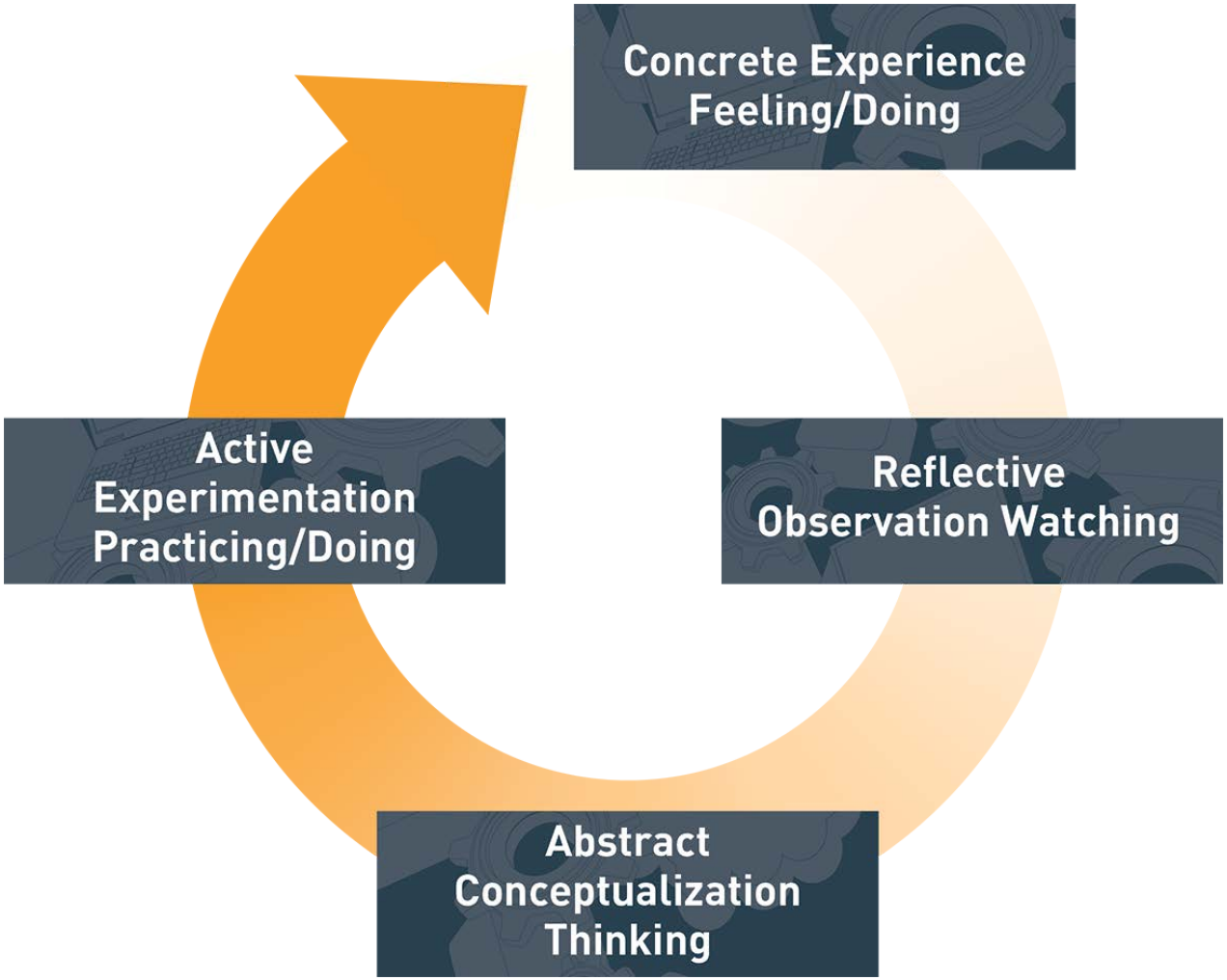

EXPERIENTIAL LEARNING
Begins with a concrete experience (for Work-Based Learning and Work-Based Courses: on the job)
Honors prior knowledge and learning context
Is represented as a continuous cycle

EXPERIENTIAL LEARNING MODEL

KOLB'S SIX MAIN CHARACTERISTICS OF EXPERIENTIAL LEARNING:

- Learning is a process, not a product.
- Learning is continuous and grounded in experience.
- Learning is full of tension; it requires effort to incorporate old and new experiences.
- Learning is the process of one's adaptation to an environment.
- Learning involves engaging with one's environment.
- Learning is the process of creating understanding using social knowledge and personal knowledge, and workplace knowledge.

KOLB'S EXPERIENTIAL LEARNING MODEL



ASSUMPTIONS DRIVING WORK-BASED COURSES:

- Workers need to see college as attainable and relevant
- Workers need to see the path to goals (future opportunities in the company, expanded skills)
- Learning through experience (both new and old) makes sense of a work context

LINKING EXPERIENTIAL LEARNING WITH COLLEGE

DISCUSSION QUESTIONS:

- How is the workplace a learning lab? What role does the worksite play in shaping learning experiences for adults?
- How can learning on site help benefit your company?
- How can you balance the needs of the production cycle with opportunities for workers to learn?
- Can learning on the job shape expectations for college going? How can this help the manufacturing industry meet new challenges?

QUESTIONS ABOUT WORK-BASED COURSE MODELS:

- How can work-based courses encourage adults to continue their formal education?
- Why is learning on the job more attractive to adults? Why might it be particularly appealing to workers in the manufacturing industry?
- How can industry use work-based courses to build its workforce?

SUPERVISOR ORIENTATION TRAINING

DESIGNING A WORK-BASED COURSE: A CONVERSATION

JOBS FOR THE FUTURE

CRAFTING YOUR WORK-BASED COURSE MODEL

- What Does The Program Look Like At Your Company?
- How Did It Get Started?
  Did You Have A Company “Champion”?
- How Does The Model Work, Who Does What,
  And How Has It Evolved?

CRAFTING YOUR WORK-BASED COURSE MODEL

- How Did The Task Analysis Provided By The College Help Your Company Envision A Work-based Course? What Was Particularly Useful Or Illuminating About This Process?

- What Were Your Goals In Implementing A Work-based Course Model?

- What Are Your Impressions So Far? What Works, What Doesn't?

- How Do You Determine Learning Objectives On The Job?
- How Do You Balance What The Worker Needs To Know Now, Vs. What He Or She Should Learn In The Future?
- How Do You Balance Work Demands And Student Learning Goals?

- How Would You Describe Working With Your Employees In This Model?
- How Do You Coach For Performance? How Are You "Creating Your Own Workforce"?
- How Do You Balance Work Demands And Student Learning Goals?

SUPERVISOR ORIENTATION TRAINING

INSTRUCTIONAL STRATEGIES FOR EXPERIENTIAL WORK-BASED COURSES

JOBS FOR THE FUTURE

TRAINING GOALS

- Qualities of a motivational supervisor/instructor
- Harnessing student motivation
- Instructional strategies for experiential learning on the job

SUPERVISORS AS INSTRUCTORS

Characteristics and Skills of Motivating Instructors /Supervisors

- Expertise
- Empathy
- Enthusiasm
- Clarity

Wlodkowski, R. J. (2011). Enhancing adult motivation to learn: A comprehensive guide for teaching all adults. John Wiley & Sons.

ENCOURAGING STUDENT MOTIVATION

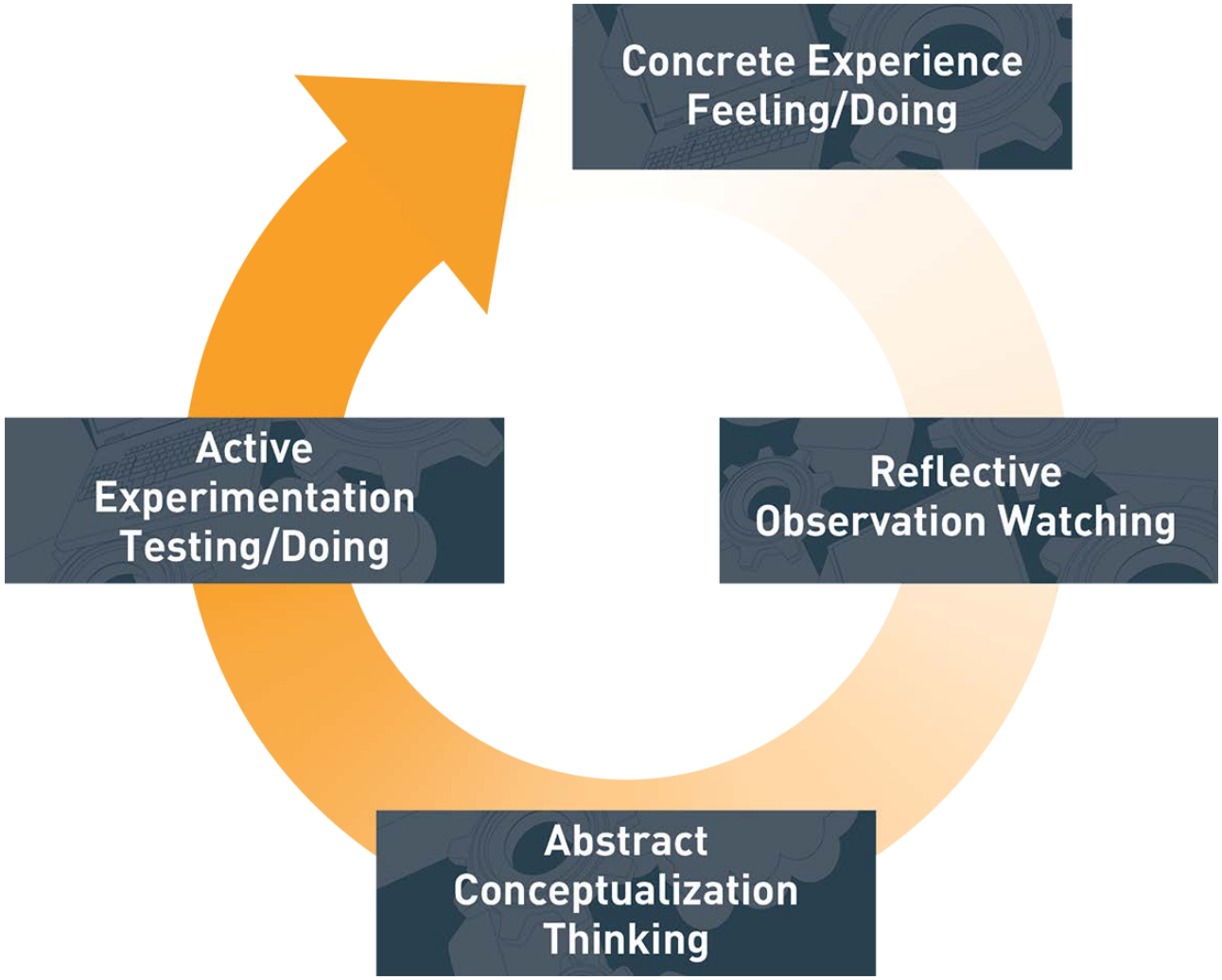
Students are motivated to learn when:

- Objectives are clear and well-defined
- Learning is situated in a real-world context
- Learning is connected to immediate AND longer-term goals
- Learning is practiced and reinforced
- Progress is apparent and feedback is shared

ENCOURAGING STUDENT MOTIVATION AND AUTOMOMY

Stage	Student	Supervisor/Teacher Role	Examples
1	Dependent	"the Expert"	Drill. Lecture. Directive in nature.
2	Interested	Motivator, Guide	Lecture and discussion. Goal setting.
3	Involved	Facilitator	Discussion and collaborative work. Practice. Team building.
4	Self-Directed	Consultant, Delegate, Supervisor	Individual or group projects. Work tasks.

KOLB'S EXPERIENTIAL LEARNING MODEL



CONCRETE EXPERIENCE:

Experiential learning here begins with a concrete, tangible experience on the job (performing a job task, for example). Activate student background knowledge so it “feels real” to them. This is the “what” of the lesson.

REFLECTIVE OBSERVATION

REFLECTING

REFLECTIVE EXPERIENCE:

It is important for students to reflect on what they have experienced and begin to internalize the lessons. In this phase, workers should be encouraged to ask questions for clarification. This gets to the “why” of the lesson.

ABSTRACT CONCEPTUALIZATION
THINKING

ABSTRACT CONCEPTUALIZATION:

The student worker should be able to understand what is being taught, and why, and begin to form the “how-to.” This is where the conceptual understanding begins and the student takes ownership of the skill or task. Troubleshooting and critical thinking are developed more fully here.

ACTIVE EXPERIMENTATION:

In this phase, students will be able to apply what they have learned and practice. Having students show you what they have learned is crucial to putting it all together. This is the what, why, how, and the concrete application of a skill.

SUPERVISOR ORIENTATION TRAINING

ACCESSING WORK-BASED COURSES AND EXPERIENTIAL LEARNING

JOBS FOR THE FUTURE

OVERVIEW

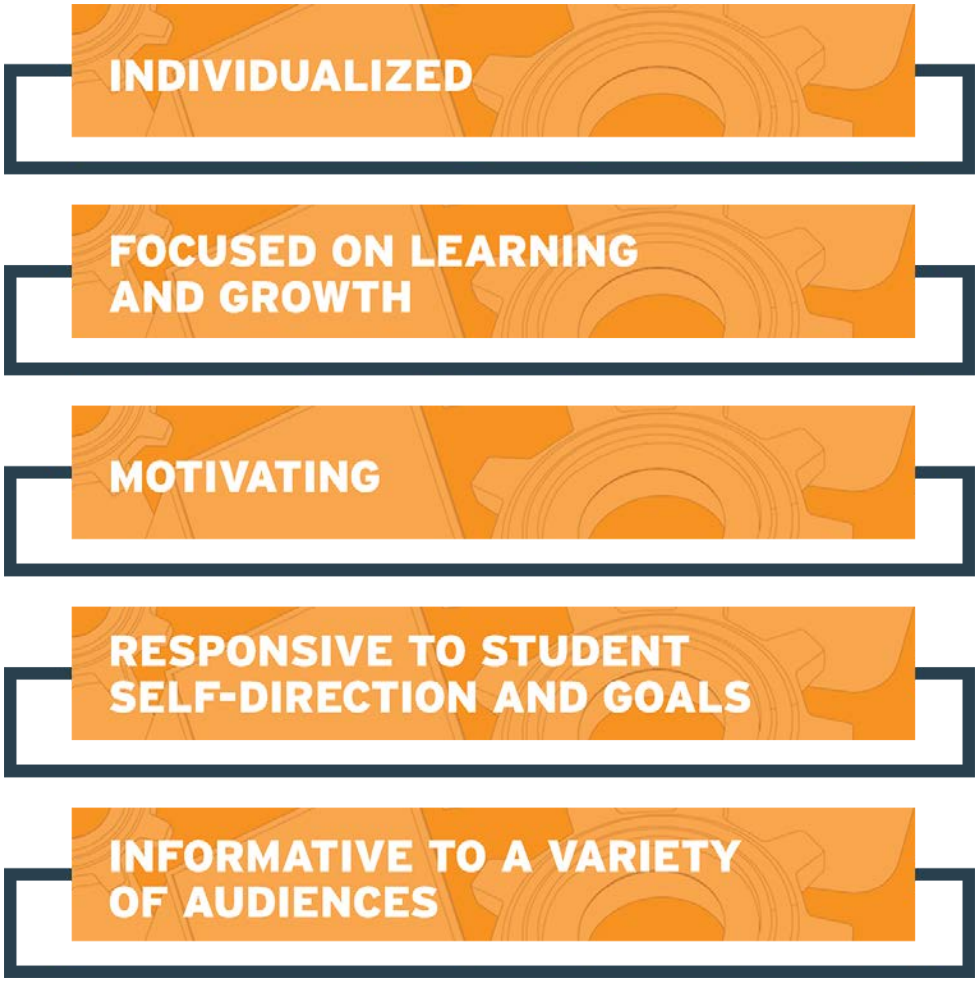
- Qualities of effective assessments
- Assessing learning at varying stages
- Putting together a “portfolio” of assessments
- Using rubrics and documenting performance on the job

ASSESSING LEARNING ON THE JOB

Documenting Learning at Work: What do you currently do?

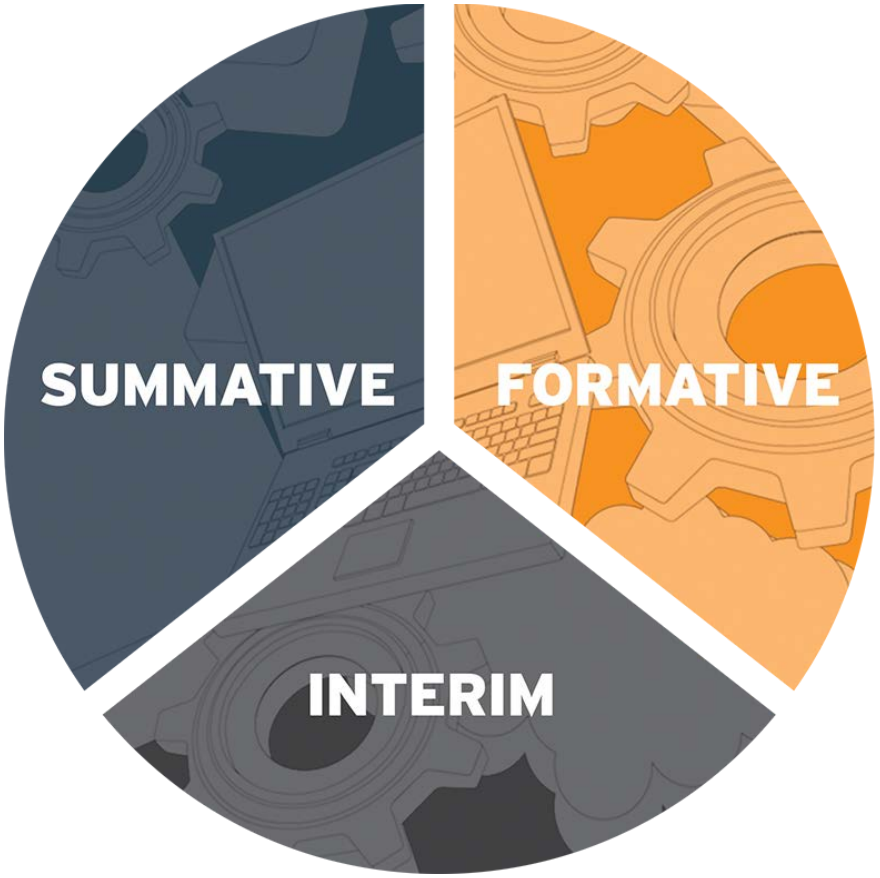
- How do you know when your workers know how to do something correctly?
- How do you know when to provide more rigorous work or opportunities for your workers?

QUALITIES OF STUDENT-CENTERED ASSESSMENT



Andrade, Heidi, Huff, Kristen, and Brooke, Georgia. *Assessing Learning*: Students at the Center Series, Jobs for the Future, 2012. Retrieved from http://www.studentsatthecenter.org/topics/assessing-learning

CONTENTS OF A COMPREHENSIVE ASSESSMENT PORTFOLIO



FORMATIVE ASSESSMENTS EXAMPLES

FORMATIVE ASSESSMENTS: ASSESSMENTS FOR LEARNING

- Documentation
- Self-assessments
- Peer assessments
- Supervisor feedback
  (written mentor notes, rubrics)

DISCUSSION QUESTIONS: FORMATIVE ASSESSMENTS

How many of you already integrate **formative assessments** in your work?

If you use peer or self-assessments, how do you collect this information?

How do you see formative assessments fitting work-based learning? If you do not conduct these now, how will you integrate these?

INTERIM ASSESSMENTS EXAMPLES

INTERIM ASSESSMENTS: ASSESSING ALONG THE WAY

- Quizzes or Drills
- Task lists
- Demonstrations/Practice

DISCUSSION QUESTIONS: FORMATIVE ASSESSMENTS

How do you use **formative assessments** in your work? What do you do?

How could you use the data from these interim assessments to inform your work as a supervisor/mentor?

How will you use these practices to collaborate with community college faculty?

SUMMATIVE ASSESSMENTS EXAMPLES

SUMMATIVE ASSESSMENTS: ASSESSMENT OF LEARNING

- Standardized or credentialing tests
- Collaborative work
- Production goals

DISCUSSION QUESTIONS: SUMMATIVE ASSESSMENTS

How could you use **summative assessments** in your work?

What instruments could you use? Could you use these instruments for placement, advancement, or data?

How could you use the data from these summative assessments to inform the work-based course model used by the community college?

GETTING BEYOND THE TASK LIST: USING RUBRICS

Skills and Competencies	Rating			Date and initial
	1	2	3	
1.				
2.				
3.				
4.				
5.				

GETTING BEYOND THE TASK LIST: USING RUBRICS EXERCISE

Module Seven: Heavy Duty Chain Drives						
Segment	**Objectives (Competencies)**	**Task**	**Delivery Environment (How could this be delivered?)**	**Instructional Method (Lecture? Lab Demo? Practice?)**	**Activities What will students do?**	**Assessment Activities How will learning be measured or captured?**
Silent Chain Drives	Objective 1 - Describe the Operation of Four Types of Sprockets and Give an Application of Each Objective 2 - Describe the Operation of a Silent Chain Drive Objective 3 - Describe How to Install and Align a Silent Chain Drive System	• Install and Align a Silent Chain Drive System	Worksite	At this point in the course, students can demonstrate their knowledge of the skills covered in the five segments of this module at the worksite.	Students will demonstrate, to the instructor, their skill in: working with silent chain drives and multiple chain drives; and lubricating and maintaining a chain drive system.	

USING RUBRICS EXERCISE (continued)

Skill or Competency	Formative	Interim	Summative
	Self-assessment	Written assignment or essay	Credentialing test or final exam

CREATING AN ASSESSMENT PORTFOLIO

FACULTY CONTRIBUTIONS

- Entry exams, standardized tests
- Official transcripts and records
- Online materials and assessments

EMPLOYER SUPERVISORS CONTRIBUTIONS

- Documentation (work logs, task lists)
- Employer work records (attendance, performance)
- Rubrics and work samples

SECTION 5: DELIVERING THE WORK-BASED

COURSE

YOU CAN GET THE THEORY, BUT THAT DOESN'T MEAN THAT YOU CAN APPLY IT. THAT'S TWO DIFFERENT THINGS. SO…ON-THE-JOB TRAINING IS YOUR OPPORTUNITY TO APPLY WHAT [YOU] GAIN IN THE CLASSROOM

- Darrell Howard, Mechanical Training Coordinator, OCTC

Each iteration of a work-based course looks different, because translating a work-based course from its design phase into action depends on how the course is incorporated in a company's workday, as well as how the college instructor incorporates the workplace in the classroom. By its nature, work-based course delivery varies to meet production realities, technology, and job skill needs of a manufacturer. On-the-job learning can only cover competencies that are present in a given work setting, and so the same work-based course may have different competencies taught by supervisors or instructors each time it is delivered at a new company.

For example, one company may have a CNC router on its production line, while another employer partner would rely on a college lab for use of a similar machine. Depending on their skills and experience, and whether they are all employed by a single employer or come from different companies, cohorts also bring varying perspectives to the work-based course.

This variability can pose challenges, but it also presents an opportunity to deliver relevant course material to meet specific employer needs.

While aspects of the delivery are customized, work-based courses are expected to maintain the rigor required of all courses in an academic manufacturing program at a community college. Mapping work-based competencies to existing course objectives, developing assessment instruments for supervisors and faculty, and ensuring team delivery across the workplace and college are critical design elements that should be incorporated in every work-based course. Beyond core design elements, some qualities of work-based courses are harder to quantify but must be present in order for the program to be both useful and successful. Conditions should be established that maximize learning on the job, in the classroom, and in a way that connects the two learning environments.

CREATING LEARNING OPPORTUNITIES AT WORK

Manufacturers can support work-based course learning in strategic and effective ways that may increase retention and advancement. In designing the structure of the course within the company, employer representatives should consider how to position their workers to be exposed to as many teachable moments as possible through the execution of their job responsibilities. If workers are enrolled in work-based courses to deepen their knowledge in their existing jobs, their normal job duties may be sufficient to observe, practice, and master the competencies covered in the work-based course. Manufacturers hoping to upskill workers to advance to new roles or occupations, such as promoting machine operators to maintenance technicians, need to intentionally design new opportunities to engage in those competencies. This may include assigning students to mentors with greater knowledge of course competencies than their direct supervisors, or varying the day-to-day responsibilities of work-based students. For example, several manufacturers that have partnered with Owensboro Community and Technical College assign work-based course students to a new department or rotate them through departments during the program as a way to expose them to some of the course content they would not otherwise experience as part of their jobs.

Supervisors or other expert mentors must also be deliberate about recognizing and maximizing learning moments for the student. Company leadership can support this by rewarding supervisors for the success of their employees or by explicitly including this kind of mentorship within the job responsibilities of their supervisors and senior technicians. can connect experiences at work to course competencies by understanding and deploying a range of instructional strategies for hands-on and problem-based learning.

COORDINATING CLASSROOM AND WORKPLACE LEARNING

Instructional variation in the classroom will mirror the variation in the workplace. Faculty members should not only teach the competencies that cannot be taught during the workday, but also pull in as many scenarios from students' work experiences as possible to demonstrate these competencies in play. Several rubrics and other course materials included in the Toolkit can help instructors incorporate these real experiences into the lessons. These resources use proven methods of problem-based learning, such as case study analysis, that have been demonstrated to be effective teaching models. These kinds of lessons can help students understand the connection and relevance of what they are learning at work in the context of what is taught in the classroom.

Instructional strategies at work and in the classroom more fully complement each other if each is recognized as a learning laboratory. Faculty members and supervisors or mentors are encouraged to communicate in order to identify emerging opportunities to tie the two components of the course together and make sure lessons are consistent and mutually reinforcing. One way to support this communication is for faculty members to check in regularly throughout the course with supervisors by email, phone, or in person about whether they have been able to identify the kinds of teaching opportunities most effective for adults during the workday. Those supervisors can also identify recent work activities and student challenges to faculty members to address in their lessons. If this kind of direct, ongoing communication is not feasible, students can bridge these two learning environments by bringing questions about classroom lessons to their supervisors and scenarios from work to college instructors for additional insights.

WORK-BASED STUDENTS AT SCHOOL AND WORK

Lewis Nall, a faculty member at OCTC, illustrates how these deliberate approaches to work-based learning on the job and in the classroom can all come together in a course:

> The great thing about that student is, okay, he does that with me, and then I send him to a shop. He works eight hours, ten hours in that shop, he may work on ten cars that day. With me, it's detailed, very specific to one component. That's part of the learning. We're developing that student. Once I get him out there in the shop, then he really gets to experience real-life experience cars. He may have a miss. He may have a hesitation. He's going to deal with all the problems that that department would deal with, if it's drivability or if it's air conditioning or if it's electrical. Then he comes back to me the next day and he's a much more attentive student, because he realizes how broad his knowledge has to be and how much more he has to learn. So he's getting experience. Then he comes in with me. I fine-tune him. I develop what he's missing.
>
> For instance, I have an electrical student that is co-opping with [a company] here in Owensboro. When he runs into a problem he can't figure out, the next time he comes to class he brings that to me, and then we concentrate on that problem. And it's great for the whole class because then everybody's learning.

From the student's perspective, the learning is enriched when this kind of dialogue occurs. Corey Marchand describes his experience as a work-based course student at OCTC and employee at OMICO Plastics:

> The classes that I'm taking right now, I'm taking a motor controls class and a fluid power class, and that's basically what I'm doing here day in and day out, working with hydraulics and pneumatics and taking apart motors and putting them back together and just seeing how they work. So it's cool to kind of learn about it at school and then come here and actually work with it.

This section provides instructional strategies, options for a work-based course student's job-assigned work responsibilities and job, and rubrics to incorporate in classroom design to maximize the effectiveness of work-based course delivery.

5-1: INSTRUCTION STRATEGIES FOR THE WORKPLACE

Type of Tool: Instructional guide and framing recommendations

Summary: This is a preliminary guide for faculty members and employer supervisors implementing work-based courses. This tool is designed to sketch out instructional strategies, orient the employer supervisor to adult learning theory, and provide guidance on basic forms of workplace learning engagement.

Why: While we know that learning occurs on the job every day and in multiple contexts, making this learning explicit is the goal of a work-based course model. This tool is designed to help employer supervisors use instructional strategies to communicate ideas, scaffold learning, and present knowledge and experience in a way that shapes student development.

Who Should Use this Tool: College faculty and employer supervisors

Spotlight on OCTC: Donald Woolridge, human resources manager for Aleris Corporation, describes the close collaboration between employer supervisors and students:

> If you were to go into our plant and see one of our employees working hand-in-hand with their supervisor, you would see a very hands-on support role. The employee does it and repeats the action to the supervisor, and the supervisor encourages the employee, and then they move through all the steps of the process. This system is done repeatedly until the employee is able to do it on his or her own."

General framing considerations

1. As instruction will be spread across multiple settings, how will faculty and employer supervisors' strategies differ?

2. How will instructional strategies differ from concept to application, and how will instruction be delivered for each phase of student development?

Community college faculty and staff understand that they need to adjust their teaching to meet the varying needs of their students, including the large part of their student body who are nontraditional learners and older adults returning to school. However, employers are often unaccustomed to thinking of their workers as learners, and they can benefit from some background in adult education as it pertains to workforce and human resource development.

Knowles's andragogy principles

Andragogy, or the theory and practice of teaching adults, is centered on four principles.

- Adults need to be involved in their own learning process.
- Adults need to learn experientially.
- Adults approach learning as problem solving.
- Adults learn best when the topic is of immediate value to work or life.

Characteristics of adult learners

- **Self-Concept:** Adults need to be responsible for their decisions on education.
- **Need to Know:** Adults need to know the reason for learning something.
- **Foundation:** Experience and trial and error provide the basis for learning activities.
- **Readiness:** Adults are most interested in what is relevant to their lives.
- **Orientation:** Adult learning is problem- or context-centered.
- **Motivation:** Adults respond better to internal versus external motivators and understand the need for learning.

Instructional strategies for the workplace

In a work-based course model, instructional duties are split between college faculty and employer supervisors on the job. For employer supervisors in particular, instructional strategies should include a consideration of the context and physical environment as well as student professional development and growth. Facilitating learning at work will require many employer supervisors to take on new roles and adapt new strategies for communication, as students' roles change and their knowledge of the workplace evolves.

GROW'S STAGES OF LEARNING AUTONOMY

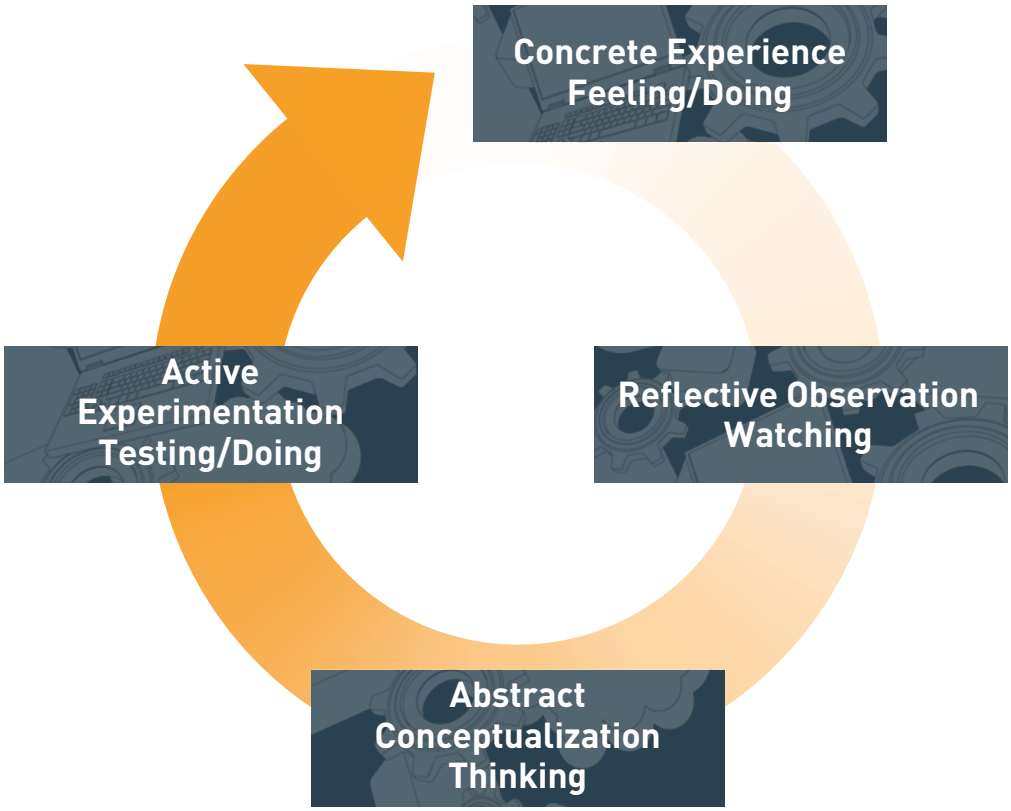
As employer supervisors begin to implement work-based courses, the roles of both supervisors and students change as learning takes place. The gradual increase of student learning should tailor how the employer supervisor guides or teaches new information.

Stage	Student Role	Supervisor/ Teacher Role	Common lesson types or formats
1	Dependent	"the Expert"	Drill or lecture. These lessons tend to be directive in nature.
2	Interested	Motivator, Guide	Lecture and discussion. These activities tend to encourage student engagement and "buy-in."
3	Involved	Facilitator	Discussion, collaborative work, or practice. These activities are generally centered on team-building or guided exploration.
4	Self-Directed	Consultant, Delegate, Supervisor	Individual or group projects or work tasks. These activities tend to be "capstone" experiences that require multiple skills.

Grow, G. O. (1991). "Teaching Learners to be Self-Directed." *Adult Education Quarterly*, 41(3), 125-149.

EXPERIENTIAL LEARNING

Teaching in the classroom and in the workplace are similar but distinct activities, and for work-based courses the grounding in a concrete experience ("doing") is a distinguishing feature. Effective approaches to teaching in the workplace include gradually increasing responsibility and hands-on learning as time and experience progress.



Visual adapted from:

1. Kolb, D. A. (2014). *Experiential Learning: Experience as the Source of Learning and Development*. FT press.

SAMPLE INSTRUCTIONAL STRATEGIES MATRIX

This matrix demonstrates common instructional strategies that can be used as learning autonomy increases.

Instructional strategy	Context	Instructor or Supervisor Roles	Student Level of Engagement	Level of Interaction	Experiential Learning Phase
Lecture	Classroom or online	Expert	Low, dependent	Low	None
Demonstration	Classroom or workplace	Expert	Low-medium, interested	Low-medium	Reflective observation
Questioning	Workplace or classroom	Motivator, mentor, guide	Medium, interested to involved	Medium	Abstract conceptualization
Problem-based scenario	Workplace or classroom	Facilitator, consultant	Medium-high, involved to self-directed	High	Active experimentation
Work assignment	Workplace	Supervisor	High, self-directed	High	Active experimentation to concrete experience

Demonstration

In the workplace, this strategy can manifest early on as a simple demonstration of a work activity with explicit explanation. An employer supervisor can use this opportunity to expose students to a work task while talking through the process and the reasoning behind its use. This strategy is suitable for the introduction of new information at the early stages of a work-based course, when the employer supervisor serves as an expert.

Questioning

As demonstrations increase in frequency on the job, and students are more aware of and exposed to various work procedures, Questioning can be introduced. Questioning is a strategy that promotes active learning by requiring students to answer a variety of questions about a task. Questions can be basic (What should I do first? What happens when I do this?) to more complex (Why do I do this? What happens if I don't do this? How does this work?), and should be used to engage students throughout the work/lesson period. This strategy is helpful from the beginning to the very end of a work-based course, when students are interested and motivated and the employer supervisor acts as a guide or mentor.

Reflection and making predictions

Much like questioning, reflection and prediction exercises are an important way to promote active learning and deeper understanding of content. Prediction exercises should be used at the beginning of a new lesson, when students have more experience with content but are not yet ready to practice on the worksite floor. Strategies include posing questions (What will happen if this breaks? What materials could I use to fix this? When I do X, what do you think will happen to the production line?) to activate prior knowledge and promote active

troubleshooting for the future. Conversely, reflection activities typically take place at the end of the lesson or demonstration. Questions to students are posed to elicit feedback on the process or procedure demonstrated and to promote reflection on the learning itself (How long did I have to react to that situation? What could have gone wrong? What did go wrong? What went right? What would you have done in this situation?) Reflection and prediction should be used throughout the work-based course, when students are motivated and involved in the learning and the employer supervisor is a mentor or guide.

Presentations or guided practice

Guided practice strategies should be used once students are more experienced. Hands-on activities should include guided manipulation of materials and the practice of procedures and processes that more experienced workers perform on the job. This strategy requires more coaching and less direct instruction, with controlled scenarios on the work floor. Examples can include the manipulation or assembly of tools and materials for specified tasks. This strategy should be implemented from the middle to end of the work-based course, when students have had much exposure to work tasks, and are motivated and involved fully. In this strategy the employer supervisor is a consultant in the learning process.

Problem-based scenario or troubleshooting

As a "capstone" experience for a course or module, a problem-based scenario can be employed in which the student is presented with a problem (a machine part needs repair, or a product is damaged) and is asked to troubleshoot and correct. This strategy is the most complex and the most difficult to implement for novice learners and should be used mainly at the end of a learning cycle. In this phase, minimal guidance is provided to the student, and the employer supervisor acts as a consultant.

RESOURCES AND REFERENCES

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2. Knowles, M.S., E.F. Holton III, & R.A. Swanson. *The Adult Learner*. Routledge, 2012.
3. Kolb, D.A. *Experiential Learning: Experience as the Source of Learning and Development*. FT Press, 2014.
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TOOL 5-2: FINDING OPPORTUNITIES FOR WORK-BASED INSTRUCTION

Type of Tool: Worksheet

Summary: This worksheet helps you navigate options for how a worker's responsibilities within the current job can be adjusted or a worker can be assigned to a new job when enrolled in work-based courses. Options include adding new tasks to workers' current jobs, temporarily rotating them through one or more departments that align with work-based course content, or transitioning them to a new role in a new department.

Why: Work-based courses rely on the job responsibilities of the worker to provide opportunities to learn, practice, and master course competencies. If the activities in their current job or department do not align with the course's lessons, even more experienced supervisors will struggle to identify opportunities for work-based instruction. Assigning workers job responsibilities most aligned with the work-based course learning objectives not only maximizes the presence of relevant teachable moments in the workplace, but allows workers to contribute to their company right away using their newly acquired skills.

Who Should Use this Tool: Employers with faculty input

Spotlight on OCTC: Frustrated for years in trying to fill skilled-maintenance positions (including one position that remained unfilled for two years as job candidates struggled to pass the hands-on test), a manufacturing plant in Kentucky signed up for work-based courses. In parallel, the company created the Maintenance Development program, which promotes production technicians to the maintenance department through a two-year training program. Work-based courses are offered throughout the two years.

On entering the program, workers transfer from their current department to the maintenance department. This maximizes hands-on exposure to the competencies taught in the work-based courses. Senior Maintenance Technicians who supervise the workers also serve as their instructors, facilitating learning on the job and answering questions about theory raised by the students. At the conclusion of the two-year program, the worker becomes a full-status maintenance worker.

This choice to reassign workers in conjunction with the work-based courses works for the company for several reasons: The department worker can immediately begin to address some of the labor demand in the maintenance department, and the permanent reassignment means that the time a supervisor invests in a worker would have long-term payoff. The transfer also allows a student to be supervised by an expert within a team of peers in the work-based course content, distributing the burden of instruction, and further connecting job responsibilities to academic lessons.

MAPPING THE COURSE TO COMPANY DEPARTMENTS

Name of course: _____

Name and current department of worker:

_____

This tool can help you determine whether workers selected for your work-based courses are currently working in jobs and departments that best align with that training. If not, this tool can guide your decision about whether to rotate the participating workers across jobs within the company or assign them to another department for the duration of the work-based courses.

Your company is providing this training opportunity to address your existing skills gaps through courses that incorporate your production processes and equipment. If workers enrolled in the classes do not have job responsibilities that allow them to observe these skills in action and practice them, they will not have the opportunity to learn course content in a way that most benefits your company. If workers taking work-based courses are instead placed in the jobs and departments that require the knowledge taught through the work-based courses, these workers will immediately begin to fill a talent need and add value to the company.

To use this worksheet, you first have to know the departments of the selected workers and the content of the work-based courses. You can then compare the job responsibilities of those workers with the competencies tied to the courses to determine whether work-based courses are best suited to:

1) Improve the job performance of participating workers (reflected in Column A)

2) Prepare students to meet the skill needs of another department (Column B)

3) Provide foundational skills that could contribute to multiple departments across the company (Column C)

DEPARTMENT OPTIONS

For each worker, select whether Column A, B, or C best corresponds to each program design consideration, and use that box to provide further detail about your expectations for how work-based courses and participants can interact with the current department, another department in the organization, or multiple departments.

	COLUMN A: Current department	COLUMN B: Other department	COLUMN C: Multiple departments
Course alignment			
Primary department with responsibilities that intersect with course competencies			
Department to which worker will be assigned upon course completion			Possibilities:
Primary supervisor with expertise that intersects with course competencies	Current supervisor	Other supervisor:	Multiple supervisors:

Table continues on next page.

	COLUMN A: Current department	COLUMN B: Other department	COLUMN C: Multiple departments
Constraints			
Continued responsibilities of the workers in their current jobs			
Specific skills that must be attained before gaining hands-on responsibilities (e.g., permission to operate a specific machine)			
Labor-management agreements are in place that would make temporary assignments to other departments difficult	Yes	Yes	No
Opportunities			
Job openings currently posted	No	Yes	Yes
Company has a general or core department with assignments across other departments	No	Yes	No
Company has an apprenticeship or other on-the-job training that reassigns or rotates workers across departments	No	Yes	Yes
TOTAL RESPONSES FOR EACH COLUMN:			

USING YOUR RESULTS

Where did most of your responses fit? Use this information to guide your thoughts on the most appropriate job and job responsibilities for a worker while they are enrolled in work-based courses and upon their completion. If most of the program design considerations matched up with:

- **COLUMN A**, the workers may already be working in the most relevant department. The work-based course may help frontline staff take on more responsibilities in their current roles. Or, even if the worker may ultimately change departments, the benefits of greater exposure to course content on the job don't seem to outweigh the challenges with a temporary move during the course.

- **COLUMN B**, the work-based course content closely maps onto another department, and it might benefit both the worker and the company to permanently transfer the worker to the new department at the start of the course. Such a move maximizes the connection between the academic learning and the new job demands, and the benefits of the skilled worker accrue to the company as soon as the trainee learns something new—not months later upon program completion.

- **COLUMN C**, the work-based course could lead to a variety of career pathways in the company. If employers are seeking to increase the breadth of a worker's expertise through these courses, remaining in a single department may limit the extent to which job responsibilities can reinforce learning in the course. Rotating students through departments or temporarily assigning them to an appropriate department can maximize the value of the class and have the long-term benefit to the company of workers who deeply understand the company's production process.

LOOKING BEYOND DEPARTMENTS

Consider giving instructional responsibilities to several supervisors or senior staff. This maximizes the number of resources that a worker has to connect job activities to academic theory, while also reducing the burden on any single staff member. Overlapping roles also allow the employer to observe the worker in various roles and permanently assign them to the supervisor or department where they can add the most value.

TOOL 5-3: USING RUBRICS AND IMPLEMENTING PROBLEM-BASED LEARNING ACTIVITIES

Type of Tool: Worksheets and planning tools

Summary: Rubrics and other work or performance-oriented materials can help facilitate learning and provide transparency for the learning process. Rubrics are designed to assist instructors in both the classroom and the workplace in gathering information on student performance, and they are used not only to evaluate particular skills, but also to illuminate degrees of proficiency and indicate areas for growth. This section is a compilation of rubric worksheets, planning tools, and templates designed to assist faculty and supervisors in implementing quality learning and assessment.

Why: Rubrics should be collected, assembled in portfolios, and used as reference material for student performance. These portfolios can be shared with or augmented by the employer supervisor. The collected rubrics can provide valuable insight of a student's progress, provide general information on strengths and areas for development, and act as a road map for further instruction.

In the manufacturing sector, rubrics should be modeled after work or job checklists, and should borrow heavily from production materials. In many instances, workplace documents can be adapted for classroom use and vice versa. The design of rubrics and other assessment measures was covered in more detail in Section Three of the Toolkit. Here, we will cover how to use them in conjunction with other work-situated learning materials and scenarios.

Who Should Use this Tool: College faculty and employer supervisors

Spotlight on OCTC: OCTC faculty who have worked with a variety of employers have found that the rubrics they issue to supervisors have provided the necessary information for course evaluation in a format accessible to supervisors with limited time and instructional background:

> I make it simple. It's a very simple sheet. It's very easily laid out for them. It states the task, and then they can grade that student one, two, three, four, five. Very simple, very easy. It doesn't [have to be done] every day. It's something that they can look at once a week, every other week, depending on the setting and the student. So we need to make it very user-friendly.

– Lewis Nall, Program Coordinator for the Automotive and Diesel Program at OCTC

SAMPLE RUBRICS AND ASSESSMENT TEMPLATES

This is a basic rubric for assessing skills in an individual unit or segment or course. The college instructor and employer should agree on the list of skills and competencies to be assessed. The supervisor will rate the work-based student's demonstrated mastery on the job on a scale of 1 to 3. The supervisor should sign and date each rating, then give the assessment to the college instructor.

Skills and Competencies	Rating			Date and initial
	1	2	3	
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Rating scale: 1=no evidence of proficiency, 2=emerging evidence of proficiency, 3= proficient/mastery

WORK-BASED CASE STUDIES AND PROJECTS

Work-based courses require a high degree of collaboration and communication between college faculty and employers, and this can provide numerous opportunities for learning activity development. Problem-based learning is an inquiry-based approach to instruction that is particularly applicable to the work-based course model. In this approach, faculty can use real-life examples or case studies from a student's workplace to examine course competencies and skills, build problem-solving ability, and provide opportunities for collaborative learning.

In a problem-based learning approach, a faculty member could use a scenario shared by an employer supervisor or student as a case study. A student could provide a narrative about a particular equipment failure, or describe a problem that has arisen on the job. Faculty can then structure an activity around this.

BASIC PROBLEM-BASED LEARNING PROCESS

A basic starting point for a problem-based learning process is outlined below. Begin this process by questioning and instructional goal setting. Once the outcome or instructional goal is clear, begin to set the stage for the students: Explain the scenario, outline terms and rules for collaboration, and present materials and assessment instruments.

- Identify what you want students to know or be able to do as a result of participating in the activity.
- Relay the problem. Use the case study material or scenario based in the student's or supervisor's company.
- Set the tone for student collaboration. To do this, describe how students should interact with one another, provide guidelines or rules for the activity, and set clear expectations for participation.
- Introduce background material, or any other additional resources necessary.
- Present rubrics and self-assessments that will demonstrate how you will evaluate the activity.
- Wrap up and have students present their solutions in groups. Reflect on the process.

BASIC PROBLEM-BASED LEARNING TEMPLATE

This template is designed to capture lesson planning notes and ideas in one place. Instructors should use this template to outline the goals, activities, and assessments for a problem-based scenario.

Because problem-based learning activities are so closely related to real-life workplace contexts, the information gathered by this template could be used to inform an employer supervisor's understanding of the work-based students. Instructors could share this recorded information later as a starting point for discussion with employer supervisors about their workers' progress in the course.

1. **Lesson Introduction:** Provide an overview of the scenario or case study.

2. **Outline Performance Objectives:** What must all students know and be able to do as a result of this learning experience?

Lesson Goal	Identified Performance Objectives	Evidence of Success
What is the overarching "point" of this lesson?	What should students be able to do after this lesson?	How will you know students are able to perform relevant tasks successfully after this lesson?

3. **Problem Statement and Questions:** Identify the problem statement for the project. Be sure you pose an authentic problem or significant question that engages students and requires core subject knowledge to solve or answer.

4. **Assessment Plan:** Outline the assessment instruments that will be used. If possible, use work-specific task lists or production documents. Outline the rubric you will use for other skills, including collaboration, critical thinking, and any others.

Rubric(s): Check all that apply	Collaboration		Written communication	
	Critical thinking		Work task lists	
	Other		Other	
Reflection exercises: Check all that apply	Survey		Peer assessment	
	Discussion		Self-assessment	
	Writing assignment		Other	

5. **Reflection:** Identify what reflection exercise you will conduct to review the success of the lesson.

When the lesson is complete, use this exercise to reflect on the lesson as a whole. Record what worked, how teams collaborated (or did not collaborate) and any other information about how the lesson went. Reflect on and record how this process could help students troubleshoot in the workplace, and, if possible, share notes with employer/supervisors.

SECTION 6: LINKING WORKERS TO

COLLEGE

MY FAMILY IS BEHIND IT. MY FAMILY SUPPORTS ME IN EVERYTHING I DO…I HAVE COLLEGE-AGED KIDS, SO I'M SHOWING THEM TO CONTINUE THEIR EDUCATION AND KEEP GOING, TOO

- Diana Millay, Work-based Course student at OCTC and Mechanical Repairman at Aleris Corp.

Beyond the educational and career value that they provide on their own, work-based courses can serve as a gateway for workers to engage or reengage in community college. Students who take other courses and ultimately obtain a certificate or a degree increase their educational, economic, and career benefits. At the same time, because the students are recruited at work and much of the instruction happens through job responsibilities, the link to college completion may not be clear to work-based course students.

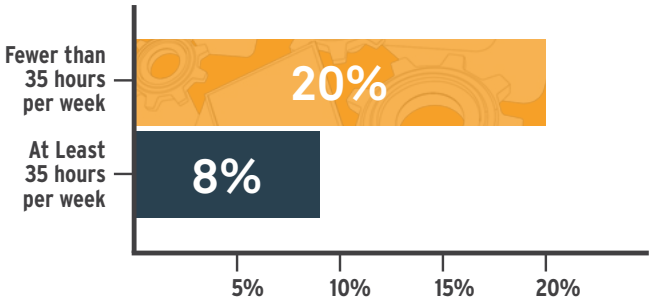
By developing internal partnerships between academic departments and college departments such as admissions and student services, colleges can build a bridge to help students continue their learning and earning potential.

One strategy to consider is supplementing work-based courses with college and career navigation services as well as other wraparound services that can help students overcome nonacademic barriers ranging from time management to transportation or housing. While not directly part of the work-based course design, these services are critical to the success of the students targeted by work-based courses. Engineering and technology students have the highest attrition rates of all STEM majors,[1] and attrition from community college is particularly pronounced among working adults. Only 8 percent of students working at least 35 hours per week obtain an associate's degree, compared with 20 percent of those working fewer hours. Similarly, part-time students graduate at a rate of 12 percent, as compared with 20 percent for full-time students. Finally, students entering directly from high school also outpace delayed-entry students in associate degree attainment, at rates of 19 percent versus 13 percent.[2] In addition, evaluations of a number of community college reform initiatives have shown that adult students succeed better when the college provides strong mentoring, tutoring, support services, and linkages to employment.[3] By design, work-based courses engage adult, working students most likely to face these additional challenges in balancing academic, work, and personal demands.

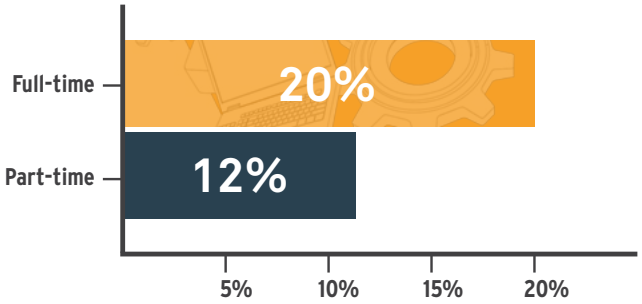
The connection between work-based courses and other programs offered by the community college will be stronger if work-based course administrators begin to consider relevant wraparound supports as part of the institutional self-assessment when preparing to introduce work-based courses to the college. At the beginning of implementation, consider how to connect participating students with the broader resources at the college and facilitate the transition to longer-term programs of study. While a number of academic and other supports will help work-based students just as they help students in traditional courses, several strategies could be particularly helpful in addressing the needs of these working students. This section highlights a few types of assistance that can help work-based students navigate both the educational landscape and their own workplace.

ASSOCIATE'S DEGREE ATTAINMENT BY:

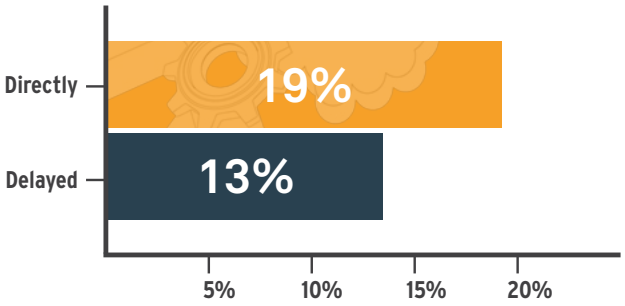
Hours Worked per Week



College Enrollment Status



Timing Entered after High School



1. Koff R., Molter L., Renninger, K.A., (2009) "Why Students Leave STEM Fields: Development of a Common Data Template and Survey Tool." Report to Alfred P. Sloan Foundation.
2. Hoachlander G., Sikora, A.C., & Horn, L. (2003). "Community College Students: Goals, Academic Preparation, and Outcomes." U.S. Department of Education, National Center for Education Statistics.
3. Bragg, Debra, Kathleen Marie Oertle, Sujung Kim, Catherine Kirby, Jason Taylor, Tim Harmon, & Loralea Liss, 2011. "Illinois Adult Education Bridges: Promising Practices. Office of Community College Research and Leadership." *Transition Highlights*. Issue 4.

IDENTIFYING EDUCATIONAL OPPORTUNITIES AND TRAINING NEEDS

Internal Career Advancement Exploration. Work-based course students are enrolled in courses that not only further their education but also help advance their careers. Students will be better positioned for career success if they are comfortable advocating for themselves within their companies. Work-based course instructors, college and career navigators, or other college staff can collaborate with the employer to encourage and prepare these students to reach out internally in their company to explore career advancement options and pathways. Networking and self-advocacy are important skills to practice both in the workplace and in a college setting.

Informational interviews are one common strategy for students to learn how to advance within an industry or company. A variety of tools, such as the Informational Interview Guide and Log in the SkillWorks Toolkit, can help students make the most of these interviews. College staff should customize this guidance for work-based course students to conduct interviews at their current place of work. For example, work-based students can speak with their direct manager about their role and ask about reaching out to others internally for informational interviews. Work-based course students also can contact their human resources department to discuss the skills required for more advanced positions, as well as how to enroll in additional training opportunities.

As work-based course instructors, college and career navigators, or other college staff work with students to define their career goals, they can help students identify what educational opportunities at the college can help them achieve those goals. College staff should align the career goals to the information on advancement that the work-based course student has learned from the company as well as similar labor market information about the skills and credentials relevant to similar employers throughout the region. Based on this, staff can help the student identify the specific courses, academic programs, and credentials that would be most valuable to meeting the student's goals.

Basic Skills Remediation. Work-based course students may learn about and enter the program through a variety of avenues. At OCTC, some students currently apply for admission to the college's work-based program at the same time they apply to work with the employer. Others are incumbent workers selected by employers. While the former already undergo a college admissions process that parallels that of traditional students, the employer-selected students come to the college through employer-defined processes unlikely to be closely tied to academic preparation. These work-based course students are likely to be reliable workers, often with many years of experience, who have shown the capacity to advance. At the same time, they also may not have been in school for many years. While some have already taken community college courses, others may have basic skills deficiencies in math and English that could curtail their success in the work-based course itself, or when they continue with traditional courses at the college.

Work-based course programs that integrate a skills assessment at the beginning of the program will be better positioned to help each student succeed. The college should determine whether work-based course students must meet the same admission requirements as other students. If not, including key elements of the admission process, such as the college's standard assessment (i.e., Accuplacer) in the course startup, can provide detailed information about the areas in which students need support. For example, one student may need extra help with fractions, while another requires a semester-long developmental education math course. Reviewing developmental options to onboard these students should be part of a work-based program strategy.

When students' skill needs are determined, the college can identify the best resources to prepare them for college-level work. Many community colleges offer basic skills remediation, including intensive, short-term boot camps, online courses, and one-on-one or group tutoring. Contextualized developmental education can be particularly appealing to incumbent workers, who would be comfortable with the industry perspective in the content. Examples of contextualized developmental education include a variety of advanced manufacturing literacy and math modules developed by the Massachusetts Community Colleges and Workforce Development Transformation Agenda. Skills Commons, developed through the U.S. Department of Labor's Trade Adjustment Assistance Community College and Career Training (TAACCCT) program, also includes contextualized math and literacy curricula. While it is beyond the scope of this toolkit to provide tools to develop strategies for the basic skills remediation of work-based course students, we encourage those designing and implementing work-based courses to leverage institutional assets to meet these needs.

ADDRESSING NONACADEMIC BARRIERS

College and Career Navigator. College and career navigators coordinate the resources of the college and community, providing one easy place for students to locate help. Navigators help students create a long-term career plan and identify the right courses and programs for those long-term career goals. They improve college outcomes by addressing systematic and psychosocial barriers students may face in addition to academic ones. As navigators build relationships with students, they also identify resources that students might not otherwise know how to find. This can be particularly helpful to work-based course students, who spend less time on campus and are likely to be less familiar with the resources available to them.

Navigators are becoming increasingly prevalent at community colleges, funded in part through federal or philanthropic grants to pilot navigator positions. The value of navigators has been clear to OCTC. The college initially funded a navigator in 2005 through a grant from the Charles Stewart Mott Foundation as part of the Breaking Through initiative of Jobs for the Future and the National Council for Workforce Education. They have since made this a permanent self-sustaining position that is funded by the college rather than grants. Cindy Fiorella, the Vice President of Workforce Solutions division of OCTC, describes how the role has become integrated in the division:

> "A navigator, referred to as a success coach, ...works with adult students, dislocated workers, and incumbent workers seeking further training. This full-time staff person provides academic and life coaching assistance, helps students with navigating college functions, mentors students, tracks their program progression, and intervenes when crises emerge."

Even when it is not financially possible to create a new navigator position, colleges can look at the roles of a navigator to determine whether existing staff positions may be able to provide these services to work-based course students.

The College and Career Navigator Training Manual, developed for JFF's Accelerating Opportunity Initiative, provides in-depth guidance on training staff for this role, along with links to additional resources. Navigators or other staff can use tools with work-based students from Coaching for College and Career: A SkillWorks Toolkit, a compilation of resources that career coaches have successfully used and adapted for their work with clients. Other helpful resources for learning how to integrate best practices of college and career navigators with program design include the Colorado Community College System SUN Navigator Manual and TAACCCT Career Coaches: Findings and Observations from the Education & Employment Research Center at Rutgers School of Management and Labor Relations.

Nonacademic Student Needs and Referrals. Work-based course students balance the competing demands of classroom and work responsibilities and their nonacademic family and financial obligations. College and career navigators, work-based course faculty, or other college staff are not expected to take on a full case management role. But it helps to be aware of questions to ask students and to be able to refer them to appropriate resources in the public workforce system, community-based organizations, and elsewhere. Often, this leads to identifying benefits and nonacademic supports that students may not be aware of.

EMPath's Bridge to Self-Sufficiency provides a holistic theory of change that can help you contextualize education and employment among other key elements of self-sufficiency: family stability, health and well-being, and financial management. The continua that define each area can provide a starting point for proactive planning to prevent or resolve barriers to success in work-based courses. Students may also be referred to a variety of national and local resources that provide critical supports. The National Resource List included as A-7 of the College and Career Navigator Training Manual provides a good starting point that compiles strong national resources for support services. Colleges can also create their own maps of parallel resources available in the community, at the college, and the work-based course student's place of work. Ideally, these services are co-located on a college campus, or someone at the college will periodically check in with their contacts in organizations that accept student referrals.

Time Management. Managing their time is a big challenge for working students.[4] While work-based courses help ease this burden by integrating some of the academic learning into the job itself, work-based course students still have to juggle and prioritize work schedules and responsibilities, time requirements of the work-based courses and homework, and family or other personal demands. Work-based course instructors can help through flexible course scheduling or opportunities to make up missed class time. In addition, orientations to work-based courses can recognize this problem and offer guidance to help students manage their time. Simple tools such as My Weekly Schedule: Time Management Exercise, developed by Study Guides and Strategies as part of their time management series, can support this discussion. In addition, work-based course faculty and supervisors, college and career navigators, or other college staff can serve as resources throughout the course to address challenges with time management as they emerge. Often, the workplace offers tips to help with managing time as well.

This section provides a brief introduction to some critical ways to help support work-based course students as they balance work-based courses, community college, and a career. When administrators and program developers understand the academic and nonacademic student supports available at the college, these connections can be effectively integrated and flagged for students. For example, an orientation to each work-based course can require students to visit the college and a career navigator as an early homework assignment. Or students can receive a short worksheet that details some of the campus resources most likely to help them. Developing and leveraging the support assets of the college is not a direct element of work-based courses and goes beyond the scope of this toolkit. However, we hope you will consider using these strategies as a way to improve student and program outcomes and success.

4. Lotkowski, Veronica A., Robbins, Steven B., Noeth, Richard J. (2004). "The Role of Academic and Non-academic Factors in Improving College Retention." ACT Policy Report.