10 Step Process to Implement Programs of Study in Missouri

Based on a pilot study conducted by
the Missouri Center for Career Education

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and Secondary Education, Division of Career Education

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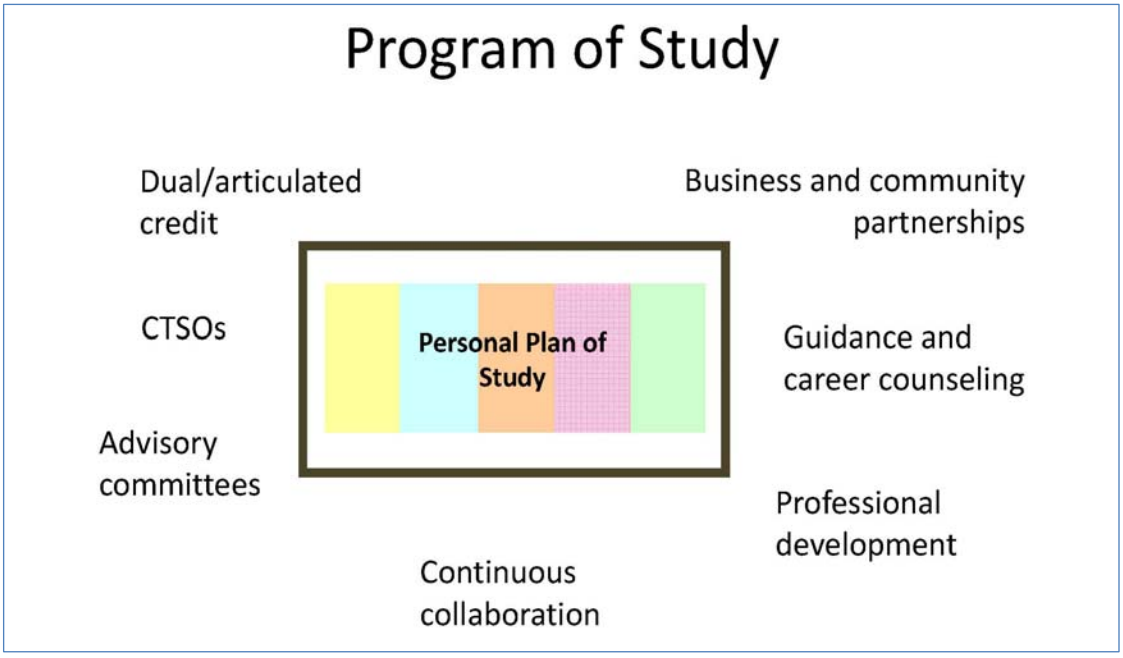
The Relationship of Career Clusters and Programs of Study



Programs of study are organized around the national Career Clusters framework. The Career Cluster framework provides an organizational tool and curricular tool which are used to develop model personal plans of study. Because the foundational knowledge and skills of the Career Clusters framework straddle secondary and postsecondary education, the framework assists institutions seeking to strengthen transitions from secondary to postsecondary education by making curriculum efficient, effective, and streamlined.

Reading through the entire Perkins Act, there are not references to "career clusters." Similarly, reading through the States' Career Cluster Initiative information, references to the Perkins Act or "programs of study" are infrequent. In much of the recent Career Clusters Initiative materials that do refer to programs of study, the term represents sequence of courses that forms the basis of a plan of study. Missouri, however, has chosen to define a program of study as representing not only a sequence of courses, but also all of the supporting institutional activities accompanying a sequence of courses that establishes a streamlined, rigorous, non-duplicative transition to postsecondary education or training. The program of study is designed to help the student more effectively institute a personal plan and at the school maintain a process of continuous improvement around the plan.

Programs of study and personal plans of study are related but not the same. A program of study is a collaborative effort among schools and colleges to seamlessly coordinate classroom instruction, student guidance, career and technical student organizations, career development and

community participation for a particular Career Cluster or Career Pathway. A program of study provides a seamless system of career exploration, preparation, and skill upgrades linked to academic credits and credentials, available with multiple entry and exit points spanning middle school, high school, postsecondary institutions, adult education, and workplace education. Programs of study are implemented at the local level and are not a program per se, but a systemic framework for a new way of doing business in our high schools, colleges, and universities. Missouri has chosen the Career Clusters framework to organize and implement its programs of study. A student's personal plan of study should reflect a program of study, but it should also be individualized for that student's career interests. The school clubs and community activities incorporated into a personal plan of study can give students practical experience to hone skills learned in the classroom and to develop personal qualities such as leadership and teamwork.

Implementation of a program of study is built upon a curriculum that addresses the Career Cluster knowledge and skills and Career Pathway knowledge and skills, as well as national and state academic standards. Standards-based curricula will move education away from narrow job-specific preparation toward a broader and more durable technical instruction while it expands, enhances and reinforces academic content.

Career Clusters provide the framework for these standards-based, rigorous studies for all students within programs of study. Local course content is aligned horizontally to knowledge and skills. The horizontal alignment is in essence a gap analysis between course content and knowledge and skills information. Particular attention is then paid to how the 'gaps' in the curriculum should be addressed. Following the gap analysis, a vertical alignment must occur between secondary and postsecondary coursework. This alignment, when implementing curricular changes at both levels and through articulation or dual credit arrangements, will provide students a seamless transition into postsecondary education. The model personal plan of study can be created after alignments are conducted and a plan for curriculum adjustment is in place.

Once the model personal plan of study is ready, the supporting institutional activities should include guidance and career counseling for students, instructor professional development, career and technical student organization activities, work-based learning opportunities and changes within the school system to aid implementation of the program of study. Details on the components expected in a program of study can be obtained from Missouri's Perkins Transition Plan.

Ten Steps to Implement Programs of Study

The process of implementing programs of study has two major components:

- Component One: Developing the model personal plan of study – This includes the development of a five- to eight-year plan for student individualization based on an occupational content area (career cluster). Steps 1-9 guide in accomplishing this component.
- Component Two: This includes the full range of activities, documents and processes that are identified in Missouri's Perkins Transition Plan to accompany and support a personal plan of study. Step 10 provides some guidance with this component.

Before looking at the steps to implement a program of study, it is important to note several key understandings about the process. First, the sequence of courses represented in a model personal plan of study do not have to be completed before institutions can begin the full range of activities to support the sequence of courses. In fact, some institutions may choose to begin both components simultaneously. It is recommended, however, that an institution begin by conducting the preparation, curriculum alignment and planning needed to develop the sample personal plan of study and then incorporate the beginnings of the second component when team members feel it is appropriate.

Time is an important element when implementing programs of study. Due to possible curricular changes and curriculum committee requirements, it may take some schools up to two years or longer to complete a model personal plan of study and have the coursework in place.

Programs of study should allow students to take high schools courses and participate in work experience that connects them to postsecondary education; therefore, a key goal of any program of study is to help students prepare for postsecondary education. For these reasons, we believe alignment (as outlined in Step 4) should begin with the postsecondary institution, move to the secondary school, and culminate in a vertical alignment between the two educational levels.

Implementation information and resources can be found in the bibliography section of this report. A significant resource worth noting is the *Career Clusters Tour Guide* Modules. The *Critical Component Self-Assessment* can be used to determine progress toward implementation. The *15 Critical Components* can help schools meet identified implementation goals when using the Career Clusters framework. Another significant resource is the *Workforce Strategy Center Toolkit*. Included in the toolkit are examples, lessons learned, and useful tools for implementing programs of study from an economic development vantage and with a focus through community college implementation.

Development of the ten steps to implement a program of study was guided by Missouri's Seven Core Concepts for Career Clusters. Application of the core concepts better enable schools and individual career education programs to help students meet the needs of the competitive 21st-century workplace. Missouri's Seven Core Concepts for Career Clusters are:

1. Learning should be student-centered.
2. Instruction should integrate academic education, career development and career and technical education.
3. Connections should be enhanced among secondary education, postsecondary education, business and economic development.
4. Rigorous and relevant academics are needed by all students, whatever their educational and career plans.
5. Secondary school instruction should prioritize foundational knowledge and skills for career preparation above job preparation.
6. Industry-verified standards should serve as a benchmark for career and technical education.
7. School reform is needed to prepare students for success in the 21st century workforce.

Step 1: Commitment and Cluster Choice

Due to the collaborative nature of developing a five- to eight- year personal plan and comprehensive program of study, no institution can implement a program of study independently. When implementing programs of study, one of the most important pieces is the identification of multi-level educational participants. It is recommended that participants include the following representatives:

Institution Level Participants

- Four-year baccalaureate degree institution administrator or program chair
- Community college president
- Community college vice president for instruction
- Community college technical dean, director of workforce development, or director of technical programs
- School district superintendent(s)
- Career center director
- High school principal(s)
- Private sector representation, economic developer
- Municipality representation
- Parents
- Counselors

Program Level Participants

- Four-year baccalaureate degree institution faculty*
- Community college faculty*
- School district faculty*
- Career center faculty*

(* denotes positions that should be represented on an implementation team in Step 2)

The first step in starting a program of study is to gain buy-in for the implementation by identifying the key partners who need to commit to the effort. It is important to obtain support from each institution's administrators. Throughout this process, many changes may need to be made to the curriculum, institutional process and policies. These changes will likely require considerable time on the part of participants. Without administrative support, proper program of study implementation may be jeopardized.

Obtaining buy-in requires key partners to become educated about the need for educational change and how the implementation of a program of study can benefit students. The *Career Clusters Tour Guide Module 2: Implementation* contains resources on fostering buy-in, developing a collaborative approach, and determining which cluster might be chosen for implementation. Detailed information for performing a local workforce gap analysis can be obtained from the *Workforce Strategy Center's Toolkit.*

Activities for the key partners may include (1) identifying implementation goals, (2) educating constituents about Career Clusters and the implication of programs of study for student transitions and workforce development issues common to all of the institutions, (3) determining a cluster for implementation, timetable for completion, and appropriate institutional representatives for the implementation team.

Understandably, key partners will need some education on programs of study, Career Clusters and other matters in order to address the issues identified in this step and perform their duties. It is recommended, however, that key partners participate in additional training with the implementation team so that all participants are involved in all conversations. For this reason, professional development for an implementation team around Career Clusters and curriculum alignment takes place in Step 3, following the formation of the implementation team in Step 2.

Step 2: The Implementation Team

The implementation team will be the core individuals who perform the course content (horizontal) alignment to knowledge and skills, gap analysis, and vertical alignment between secondary and postsecondary institutions. These processes constitute a very large portion of the time commitment to implement a program of study. The implementation team may consist of program-level participants identified above, as well as other content specialists for the cluster chosen for implementation.

Secondary content experts will perform an alignment between their course content, objectives and competencies for the secondary courses and programs. Postsecondary content experts will perform an alignment for the postsecondary courses and programs. However, these two groups should work together on the vertical alignment, which establishes a seamless sequence of courses from one level or institution to the next (this takes place in Step 7).

The implementation team may wish to select a trained facilitator. It is recommended that facilitators be used to keep the team on task, provide an outside perspective and ask the more difficult questions. Facilitators may also provide an avenue for professional development.

The implementation team should be provided professional development on Career Clusters, Career Pathways, programs of study, personal plans of study and the benefits reaped by institutions as a result of implementing a program of study. The implementation team should schedule an appropriate amount of time for planning and development, as this project may require more than the equivalent of one full day per month.

The implementation team should review all ten steps of the implementation process prior to beginning. It is very important to note that certain specific curriculum elements (see Step 4) need to be in place prior to alignment. These elements should be identified and a timeline for delivery set.

Step 3: Foundational Professional Development

Although mentioned previously, the importance professional development in successfully implementing a program of study cannot be over emphasized. All team members and participants should participate in joint sessions regarding Career Clusters, Career Pathways, programs of study, plans of study, knowledge and skill statements and the benefits that Career Clusters and programs of study can provide for all learners. These are important concepts that must be understood before beginning the alignment process. Participants may plan site visits to other institutions involved in implementing programs of study, or they may invite representatives from other institutions who are further along in the implementation process to a local meeting. The *Career Clusters Tour Guide-Module 1: Introduction* may be used as a primary resource for professional development.

After reviewing the ten steps to implement a program of study, the implementation team may determine that additional professional development in the area of curriculum development is necessary before beginning the alignment phase. In Step 4, the implementation team begins assessing curriculum needs to implement a program of study.

Step 4: Alignment of Course Competencies with Knowledge and Skills

Program of study implementation is built upon curricula that address the Career Cluster knowledge and skills and Pathway knowledge and skills, as well as national and state academic standards. Standards-based curriculum moves education away from narrow job-specific preparation toward broader and more durable technical instruction. Standards-based curriculum also expands, enhances and reinforces academic content. Determining where curriculum reflects current knowledge and skills is what alignment is all about.

The alignment process may be the most tedious part of implementing a program of study. Alignment is done by crosswalking or comparing course competencies to the standards represented in the knowledge and skills. The purpose of this alignment is to determine gaps between the competencies and the knowledge and skills. A document has been developed to assist with this process (Cluster Alignment Table).

Be aware that when completing an alignment, some courses or programs may not have written competencies. An alignment can be performed by a content expert for that school's program or course without written competencies. However, there are serious concerns with doing this. When faculty who teach courses without written competencies leave an institution, they take with them all the information used to develop an alignment. Also, when schools begin working on articulated or dual credit, course competencies will be necessary to verify common curricular elements. Lack of written competencies also calls into question the institution's and instructor's ability to effectively assess student learning. Without competencies, there is no guarantee that students possess the knowledge required to successfully transition to higher-level coursework. When beginning an alignment, it is recommended that written competencies be developed if they do not already exist and that they be provided to the alignment team.

For the secondary level, the alignment process crosswalks course and/or program competencies with the cluster level (foundation) knowledge and skills. For postsecondary institutions, competencies are aligned with both cluster level and pathway level knowledge and skills. Since each knowledge and skill statement within the cluster is made up of performance elements and measurement criteria, it will be important for the institution to determine whether course competencies align more appropriately with the knowledge and skill statement, performance element or measurement criteria. Alignment of competencies is recommended with the measurement criteria, and the Cluster Alignment Table has been prepared for each of the clusters in this fashion.

To use the Cluster Alignment Table, course competencies should first be placed in the column headers on the table. Then, measurement criteria (listed down the left side of the form) included

in the curriculum should be indicated by placing an X within the box coinciding with the competency and measurement criterion. Once all measurement criteria under a performance element have been addressed, the performance element box should be checked. All measurement criteria must be checked to consider a course as fulfilling instructional requirements for a performance element. The same process should be used at the statement level; all performance elements must be checked under a given statement in order for an institution be considered to fulfill instructional requirements for that particular statement. A gap occurs when a measurement criterion is not checked (and therefore the corresponding performance element and statement cannot be checked). Gaps further are addressed in Step 5.

Measurement criteria from the clusters and pathways are not always addressed in courses. Some measurement criteria are addressed within CTSO involvement, internship or work experience, academic courses or other extracurricular activities students in which students are involved. However, all knowledge and skills should be located in some way within a single program. For example, students who choose a pathway within the Business, Management, and Administration cluster should be required to take Business I and Business II if those courses are designated to contain ALL of the cluster knowledge and skills. Similarly, if knowledge and skills are addressed across six courses, students should be required to take all six courses.

In order to adequately address measurement criteria that are included in academic course content, the alignment team should collaborate with academic course instructors to confirm the inclusion of those criteria in the course content.

At this point, alignment of career and technical courses with the cluster knowledge and skills is finished. However, to address postsecondary remediation concerns, an additional alignment within academic content is needed to provide an opportunity for students to acquire the requisite skills needed to enter the workforce or continue their education in the pathway they have chosen. The Academic Alignment Table contains the knowledge and skills identified by a Missouri-wide consortium of community college developmental instructors that are required to avoid remedial coursework. The table contains skill statements or rubric statements rather than measurement criteria or performance elements.

To complete the Academic Alignment Table, it will be necessary to search out the courses within the school and within the newly-aligned program to determine where these skills are learned. As courses are located, the name of the course should be noted in the space provided so those courses will be included in the model personal plan of study. If the course where the skill is learned cannot be identified, it may be necessary to lobby the instructor of the most appropriate course to include this skill in his or her instructional plans. Reinforcing academic skills within CTE coursework ensures that students have the opportunity to learn that skill.

Step 5: Gap Identification and Remedy

After aligning the course competencies with the knowledge and skills, it should be apparent where gaps (knowledge and/or skill is not taught) or overages (competencies are above or beyond knowledge and skills) occur. Overages do not necessarily represent a problem, unless they prevent inclusion of all of the knowledge and skills in a given program. Local advisory committee input may lead to the addition of competencies for cources, and these are very important to a program. Gaps should almost always be considered a problem, and steps should be taken to resolve the alignment weakness. Not all knowledge and skills must be taught within courses, but may be addressed through student CTSO involvement and work experience.

Steps should be taken to address the gaps and determine how each student will learn the knowledge and skills for the chosen cluster. These steps may include course competency revision, course addition or course deletion. Course descriptions and prerequisites should be revised and/or rewritten as appropriate.

This step is integral to creating seamless transitions between secondary and postsecondary coursework and is likely to involve curricular changes.

Step 6: Local Validation and Credentialing

Upon completion of the alignment and gap analysis, information should be shared with the local advisory committee to conduct a local validation of updated, nationally-aligned course competencies. The advisory committee can address gaps that appear and identify appropriate opportunities for students to receive industry credentials. Advisory committee members should be considered content experts; they may have a better feel for how clusters fit with the occupational area. However, advisory committee members may want to add knowledge and skill statements. If these are added, appropriate performance elements and measurement criteria need to be developed.

Step 7: Vertical Alignment and Transition Links

Once horizontal alignment is completed, representatives of all educational levels (secondary, two-year and four-year) should meet and perform a vertical alignment. Courses that link programs between educational levels (secondary to two-year, secondary to four-year, and two-year to four-year) should be compared. These courses are transitionary between the educational levels. This step provides critical information needed to complete a personal plan of study. The vertical alignment establishes and documents the seamless transition for students who utilize the program of study, and this is a defining feature of a program of study.

Step 8: Create Transition Opportunities

Completing the vertical alignment will facilitate creation of transition opportunities. It is important to determine criteria for successful articulation. These criteria should be based on measurable criteria and conditions. This work may require revision of competencies so that courses share similar outcomes. The alignment table may need to be updated to represent the most current content. Determining appropriate articulation strategies will become much easier because courses now have common outcomes as evidenced through written and performance assessment(s). With common written course competencies, institutions can generate syllabi for articulated courses and dual credit opportunities and/or articulation assessments, if appropriate. Concerns may arise between institutions when courses are similar, but the receiving institution's courses are perceived to have more depth. A simple way to resolve this issue is for the receiving institution to make sure their performance elements and measurement criteria are at a higher level (according to Bloom's Taxonomy or the Rigor and Relevance Framework) in order to justify the claim.

Step 9 Create the Personal Plan of Study

With the horizontal alignment, gap analysis and vertical alignment complete, school are now ready to prepare a model personal plan of study. Use of previously-drafted Missouri personal plans will help ensure all required elements are incorporated. Missouri's Perkins Transition Plan may offer other critical elements to be incorporated into the personal plan. Secondary institutions should work closely with their counselors to develop the model personal plan of study in a way that ensures graduation requirements are met and course sequencing is appropriate to avoid remediation at postsecondary institutions. Identifying occupations and skill levels attained at appropriate exit points will help students relate their coursework and personal interests to potential future careers. Fully implementing a comprehensive guidance program for students is also very important to ensure that students are equipped with the personal skills to navigate the educational system with a personal plan of study, complete their coursework and develop the social skills needed in today's workplace.

To effectively develop a personal plan of study, successful secondary curriculum should meet the following principles:

- Meet state academic standards and Grade Level Expectations;
- Meet high school testing and exit requirements;
- Provide additional preparation to ensure college readiness;
- Meet college entrance and placement requirements;
- Provide academic and career-related knowledge and skill in a chosen Career Cluster or Career Pathway; and
- Provide opportunities for learners to earn college credit through credit-based transition programs such as dual credit and articulation.

Step 10: Environment of Continuous Improvement

An environment of continuous improvement is a key Perkins Act requirement that needs to be in place to successfully implement programs of study. This step may accurately seem undeveloped. The 2007 pilot did not encompass this component of implementation. School leaders should consider reviewing school improvement processes that focus on data-driven decision making such as those represented in the *High Schools That Work* Site Development Workshops, Professional Learning Communities and the Career Clusters implementation guide. Additional information is available in Missouri's Perkins Transition Plan.

Once completed, the implementation team may find it helpful to critique their work against the *Career Clusters Critical Component Self-Assessment,* which can be found in the implementation tour guide. This is a good way to refine any errors or omissions that may have found their way into the implementation processes.

Section 2A of the Missouri Perkins Transition Plan outlines and defines the elements of a successful program of study. A review of this section may influence the implementation team to change certain elements or outcomes.

The implementation team should set attainable goals for reducing student remediation or increasing successful student transitions. The team should determine current status, future goals and ways to attain the goals while recognizing that changes may need to occur. Data sources will need to be identified to measure progress and timelines should be set for gathering data and discussing the results. *At Your Fingertips, Using Everyday Data To Improve Your Schools* is a good resource for effective data collection and analysis.

Other requirements for programs of study in Missouri include the supporting activities, services and policies within an institution that sustain the effort. These requirements can be found under A.2.(a) of Missouri's Perkins Transition Plan and include:

- Collecting qualitative and quantitative data on academic and career success, retention rates, dropouts, graduation, transitions and remediation that are used institutionally to review and modify the program of study;
- Using data for planning and decision making at all levels;
- Providing high quality professional development for faculty, administrators and counselors to improve teaching and learning and integration of technical and academic instruction for improved student achievement; and
- Maintaining ongoing dialogue among secondary, postsecondary, business and parent partners at the state and local levels.

Purpose of the Project

In the spring of 2007, staff at the Missouri Center for Career Education undertook a pilot study from the Division of Career Education to develop a process for implementation of programs of study. The process addressed alignment of existing courses and/or programs (content) within the context of Career Clusters and Career Pathways. The steps involved in the development process were documented and formed the basis of this 10 step process to implement programs of study. The project also allowed for the testing of tools (software) sites can use as they begin the implementation process. The process can be replicated or adapted for future development of additional programs of study.

Programs of study are a new requirement for recipients of funding under the Carl D. Perkins Career and Technical Education Act of 2006 (Perkins Act). Programs of study will help local education agencies (LEAs) better ensure students:

1. receive instruction at the secondary level that includes rigorous and coherent content in both academic and career and technical education;
2. meet state standards, graduation requirements, and college entrance requirements; and
3. complete programs at the postsecondary level that lead to high skill, high wage or high demand occupations.

The two clusters and their respective pathways chosen for the pilot are Agriculture, Food, and Natural Resources, Plant Systems pathway; and Health Science, Therapeutic Services pathway. This project aligned the cluster level knowledge and skills from the national initiative with existing career and technical education secondary courses, as well as cluster- and pathway-level knowledge and skills with existing career and technical education postsecondary courses. The process, including validation, helps ensure that the starting point each student uses to create their personal plan of study, if successfully completed, allows the student to move smoothly into postsecondary education.

Team Members

Those involved in this pilot project played a very important role. Some acted as facilitators to the process, while others acted as content experts. The Missouri Center for Career Education truly appreciates the participation of all individuals who were involved and thanks everyone for the time commitment to ensure the success of this project.

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Afterword: Advice from Practitioners

As the title of the booklet indicates, the implementation of Programs of Study is a process, and as such is subject to interpretations from the practitioners who implement the process. During the 2007-2008 school year we asked the Missouri Tech Prep Consortiums and their coordinators to implement pilot POS using the 10 steps outlined in this booklet. We requested two deliverables as a result of those pilots: A model Personal Plan of Study; and a list of lessons learned, suggestions for improvement, and observations about the 10-step POS process. Based on that information we have added this Afterword to the POS booklet in hopes that some of the advice, observations, and misconceptions that resulted during the pilots will help you in your POS efforts. The comments and advice are organized by category as follows:

- **Knowledge and Skills Statements (K and S):** Observations and comments concerning the clusters knowledge and skill statements, their usefulness, and issues related to alignment of those statements.
- **Rigor/Depth of Knowledge (DOK):** Observations and comments about measuring the profundity and breadth of subject matter and the intensity of instruction.
- **Gap Identification and Remedy:** Observations about how to deal with the placement of K and S statements within coursework.
- **Student Performance:** Observations concerning the positive and negative results of instruction as measured on assessments using K and S statements, performance levels, and measurement criteria placed and assessed within an institutions coursework.
- **Continuous Improvement:** Observations and suggestions concerning the sustainability, viability, reliability and validity of the POS process.
- **Misconception Alerts:** We have borrowed this term and its use from the Grant Wiggins and Jay McTighe book "Understanding by Design." Our purpose in using the term is to point out to future practitioners assumptions and conclusions that may on the surface appear to the casual reader and observer to be correct when they contain inherent fallacies.
- **Before You Begin:** Read the 10-Step Process, complete the evaluation rubric and then review this section of advice, observations and misconceptions. We believe that as a result of preparing in this manner, you will have yourself time and keep yourself and your partners from making some common mistakes and/or misconceptions about the Programs of Study process.

Knowledge and Skill Statements (K and S)

1. Cluster K & S statements are general. This is something that will be important to know when working on POS.
2. K & S: Educators must understand that these are related to industry and not just a counseling piece.
3. Do not try to interpret the logic behind the existence of a K and S statement, performance level, or measurement criteria. Once you begin to second-guess the validity and reliability of these statements you might as well abandon any alignment process and make up your own competencies.

Rigor/Depth of Knowledge (DOK)

4. Cluster measurement criteria define the expectation using specific performance levels to define the degree of depth and rigor of instruction. Do not assume that simply because a concept is taught at the post-secondary level that it is superior to any in-depth instruction at the secondary level.
5. Breaking the K & S Standards down to Depth of Knowledge was a key to learning what was happening in each program/school. The discussion about the standards themselves was key to the success of the pilot.

Gap Identification and Remedy

6. Do not assume that because a K and S statement is not taught in an academic or a technical class that you must find another outside course for that competency. Rather you may have to adjust curricular priorities within that course. Especially if local district graduation requirements make it difficult if not impossible to add additional coursework.

Student Performance

7. An alignment of skills and measurement criteria is not enough to guarantee that students will perform at those levels. Once a valid and reliable alignment has taken place and final student performance does not measure up the issue becomes one of effective student placement, instruction and formative assessment. For example, if we find that graduating seniors often fail to score properly on math placement assessments for post-secondary schools and apprenticeships but have not taken any mathematics their senior year, the conclusion that the performance criteria are at fault seems to be illogical. Rather one should look to proper course placement.
8. It is important that students come from the secondary in to the post-secondary programs with the foundation K & S mastered, including the ability to read, write and do math at the college level.

Continuous Improvement

9. You will probably underestimate the time required of your team to complete the project. In the world of education there are many factors which will consume partners time such as, testing, weather, school breaks, and schedules to name only a few. Set a calendar and try to live with it.
10. The POS process is never finished. Courses, requirements, industry standards, and expectations are constantly changing so to will the POS process.
11. Rather than aligning course by course, do it by exit points. The real conversations begin at these exit points (high school => career center => postsecondary program).
12. Take a closer look at your articulation agreements. Some of the secondary courses that we previously articulated did not cover all of the postsecondary course content.
13. As a result of our work with the Early Childhood Education teachers, we are going to be moving toward end-of-course/end-of-program common assessments. The high school, career center and college teachers all agreed this was the best approach because it provides a better indication of a student's mastery of essential competencies than articulation agreements or dual credit.

14. Do not neglect the role of a facilitator. Dialogue among the schools: often when instructors from different levels (secondary and postsecondary) get together they are so defensive of their curriculum that they don't really have a dialogue because they are so busy defending their own curriculum. The ability to have a dialogue and compare and contrast the standards was refreshing.
15. Get all of the right people at the table.
16. Be open-minded and willing to discuss issues.
17. Have a hard copy of the 10-step process for implementing the Programs of Study at the beginning.
18. The work needed to be planned out and organized better so that we did not spend so much time talking, but more time accomplishing something.
19. It was VERY helpful to have already developed collaboration with FACS teachers in the 11 sending high schools. This ensured participation, if not buy-in from those who would be impacted by decisions made. It gave us more diverse perspectives to review and consider. Representatives from PVCC had been and continued to be responsive to collaboration questions and thus the desire was there to be helpful in return.
20. We need to include entry & exit points along the continuum.

Misconception Alerts

21. *"Some high schools may teach aligned competencies across multiple courses. The student may not have the opportunity to take all of these courses in high school and complete a Personal Plan of Study."* Do not assume that because a K and S statement is not taught in an academic or a technical class that you must find another outside course for that competency. Rather you may have to adjust curricular priorities within that course. This is especially true if local district graduation requirements make it difficult if not impossible to add additional coursework.
22. *"When aligning with DOK levels: Are we answering for the expectation or reality? We decided to align for the expectation."* Cluster measurement criteria define the expectation using specific performance levels to define the degree of depth and rigor of instruction. Do not assume that simply because a concept is taught at the post-secondary level that it is superior to any in-depth instruction at the secondary level.

Definitions

The following definitions were developed and used during the pilot project.

Career Cluster - Career Clusters are an organizing tool that groups occupations and careers based on common knowledge and skills. As a tool, they assist educators in tailoring coursework and work experience around specific occupational groups (i.e. Health Science or Human Services) that offer students core academics as well as activities that match their skills and interests. Clusters include a wide range of occupations, even those not usually found in career and technical education. Occupations within a cluster are grouped according to shared commonalities, and each of these subgroupings is called a Career Pathway. Career Clusters contain multiple pathways. Career Clusters also provide additional depth and curriculum standards to Missouri's Career Paths model for career development.

Career Pathway - Career Pathways are listings of occupations that share advanced technical skills and/or common roles within a Career Cluster. A pathway belongs to one cluster, but a cluster may have multiple pathways. Each pathway within a cluster contains listings of common knowledge and skills that are shared among occupations within the pathway.

Pathways can assist educators in their development of a coordinated and non-duplicative sequence of courses that:

- Identifies both secondary and postsecondary educational elements;
- Includes challenging academic and career and technical education content; and
- May culminate in technical skill proficiency, a postsecondary degree, a credential, a certificate, or a degree at the secondary and/or postsecondary level.

Competency Profile - Competency profiles are lists of duties and/or measurable learner objectives and tasks a person would need to know and successfully perform in a given occupation. Educators use them to develop courses and curriculum. Competencies require students to demonstrate mastery of tasks related to an occupation or career field. Currently, many courses in a student's schedule, especially career and technical courses, are developed around competency profiles. It is expected that competency profiles will eventually be aligned with Career Cluster knowledge and skills.

Gap Analysis – Gap analysis is a tool borrowed from the business world and used by educators as a part of any school improvement efforts. The goal of gap analysis is to identify differences between existing educational programming and curriculum and a desired level of educational programming and curriculum. In the context of programs of study, a gap analysis begins with the comparison, or alignment, of current course competencies, objectives and outcomes with the

Career Cluster and/or Career Pathway knowledge and skills. This process may identify gaps between the current curriculum and the cluster and/or pathway knowledge and skills. Following the identification of these gaps, the gap analysis involves a review of the gaps and a determination of what remedies will be taken by an institution to address them. Example remedies may include actions such as incorporation of previously unaddressed knowledge and skills into existing curricula, or the development of additional courses designed around knowledge and skills not found in the current curriculum.

Knowledge and Skill (K&S) Statements - Knowledge and skill statements represent the knowledge and skills, both academic and technical, that all students should achieve in order to demonstrate competence in a given Career Cluster or Career Pathway.

Cluster K&S statements, also called foundation K&S statements, are common across all pathways within a cluster and represent the fundamental core skills a person needs to be successful within any occupation in the cluster. Pathway K&S statements are a listing of pathway-specific skills common to the occupations listed in the pathway. Pathway knowledge and skill statements represent the knowledge and skills, both academic and technical, necessary to pursue a full range of career opportunities within a pathway, ranging from entry level to management, including technical and professional career specialties.

Personal Plan of Study – A personal plan of study is a student's scope and sequence of coursework and co-curricular experiences based upon his or her chosen Career Pathway or Career Cluster. The foundation of the personal plan of study is the school-approved program of study for the student's cluster or pathway. The personal plan of study is a map of coursework and experiences including graduation requirements, approved coursework for the student's educational and career goals, developmentally appropriate work-based learning experiences and relevant co-curricular activities.

Personal plans of study are developed cooperatively with the student and the student's counselor, teachers and parents. They are reviewed at least annually and revised as needed.

A written personal plan of study for a CTE student:

- Is developed with career guidance and academic counseling staff and in consultation with parents, not later than in the first year of secondary school or upon enrollment in career and technical education;
- Is reviewed annually by students, parents and career counseling staff and modified as needed;

- Includes relevant information on secondary school requirements for graduation with a diploma; postsecondary education admission requirements; high skill, high wage, or high demand occupations; nontraditional pathways in emerging and established professions; and labor market indicators;
- Is developed in conjunction with the student to meet the student's goals;
- States the student's secondary school graduation goals and postsecondary education and training or employment goals, and identifies one or more Career Pathway that correspond to the goals; and
- Contains both academic and career and technical courses that, upon successful completion, position the student to matriculate to postsecondary education without the need for remediation.

Program of Study (curriculum framework) – Programs of study are a way to provide a seamless system of career exploration, preparation, and skill upgrades linked to academic credits and credentials, available with multiple entry and exit points spanning middle school, high school, postsecondary institutions, adult education and workplace education. Programs of study are implemented at the local level and are not a program per se, but a systemic framework for a new way of doing business in our high schools, colleges, and universities. Missouri has chosen Career Clusters as a basis to organize and implement its programs of study. Details regarding a program of study in Missouri can be found in Missouri's Perkins Transition Plan.

During the transition period, Missouri will develop a framework and process for secondary and postsecondary education to implement programs of study. The framework will include a full range of activities, documents and processes that can be incorporated across the state at the local level. Each program of study will include a three-part curriculum framework built around a 4 + 2 (+2) articulation model. A program of study requires the following participation from secondary, postsecondary and business partners.

Secondary:

- Career and technical education course competency alignment to the Missouri Show-Me Standards and Grade Level Expectations.
- Courses meeting postsecondary (both two-year and four-year college) entrance requirements appropriate for the Career Pathway within the overall program of study.
- Academic and career and technical education foundation knowledge and skills validated by Missouri industry advisory councils.
- Opportunities for students to earn college credit through dual credit and/or articulated credit.
- Opportunities for students to earn or make documentable progress toward an industry-recognized credential or certificate, if appropriate.

- Opportunities for students to engage in leadership development through the appropriate Career and Technical Student Organization (CTSO).
- Work-based learning experiences for students where appropriate, as early as the ninth grade.

Postsecondary:

- Alignment and/or articulation of competencies between appropriate secondary programs.
- Alignment and/or articulation of competencies between one-year certificate, two-year degree, and four-year degree programs.
- Alignment with industry-recognized knowledge and skills, which leads to a certificate, credential, two-year or four-year degree.
- Preparation for employment in high-skill, high-wage and/or high-demand careers with multiple exit points.

Business:

- Work-based learning experiences where appropriate, as early as the ninth grade.
- Business and industry participation in an advisory capacity.
- Ongoing support for the programs of study, such as mentoring teachers for industry-specific knowledge, assisting with student projects, and providing relevant experiences that are based upon all aspects of the industry.

In addition to the above criteria:

1. Collaborative efforts with secondary, postsecondary and business and industry in preparing a gap analysis between course and/or program outcomes or competencies and industry-recognized knowledge and skills.
2. Steps taken to address any gaps found.
3. Comprehensive student career guidance and counseling.
4. Development of a culture focused on continuous improvement by:
    - Collecting qualitative and quantitative data on academic and career success, retention rates, dropouts, graduation, transition and remediation.
    - Using data for planning and decision making at all levels.
    - Providing high-quality professional development for faculty, administrators, and counselors to improve teaching and learning and integration of technical and academic instruction for improved student achievement.
    - Maintaining ongoing dialogue among secondary, postsecondary, business, and parent partners at the state and local levels.

Guidance and Articulation

The question often arises about which option, articulation or dual credit, is best for students. It appears nationally there is a trend toward dual credit. With significant use of dual credit courses, the secondary component of the model personal plan of study includes college coursework, and the need for an extensive comparison of competencies is unnecessary. However, articulated credit calls for a close alignment of coursework and continuous review of both institutions' course revisions, student success in avoiding the need for remedial coursework, student success in subsequent higher-level coursework and student completion rates.

Dual Credit Program

Dual credit programs provide college-level courses that can be taken while still in high school. These are credit courses that count toward both a high school diploma and a college degree. With dual credit, students can obtain credit equivalent to more than half of their freshman college year before they have graduated from high school.

Dual credit is an excellent opportunity for students to get an early start on college and find out what a college course is like. Dual credit hours are transcripted by the participating postsecondary institutions, and they are transferable to public universities and colleges in Missouri, as well as many private institutions. Students also have many academic and workforce courses options when choosing dual credit courses.

Articulated Credit

Articulated credit allows high school students to receive college credit for technical courses they complete while in high school. The articulation process eliminates the need for duplication of courses at the college level.

There are numerous opportunities for students to earn articulated credit. Generally, courses that apply to technical degrees and/or certificates are eligible for articulated credit. Some examples include agriculture, building trades, child development, computer information, automotive technology, business technology, health occupations and marine technology. Whether these courses are taken at an area technical center or a comprehensive high school, an articulation agreement needs to be signed between a secondary institution and a postsecondary institution. A signed articulation agreement indicates the technical center or high school is successfully teaching a substantial amount of the course competencies required by the receiving

postsecondary institution. This ensures students are learning the core objectives of the class and will be successful in subsequent classes once they transfer.

Following graduation, students have one year to enroll in the receiving postsecondary institution in order to receive the credit. Once transcripted, however, these courses may then be transferable to other colleges. Articulated credit allows students to save money on tuition and fees, and it can eliminate the need to take courses at the college level that duplicate courses at the high school.

Software

Early in the planning stages of the pilot, it was clear the knowledge and skills would need to be aligned with existing Missouri CTE course competencies. It is easy to come to that conclusion after reading the material related to career pathway implementation and reviewing the work of many states in their journey to use Career Clusters for implementation of programs of study. The prospect of manual alignment was daunting. Additionally, questions arose concerning what would happen after the alignment. How will educators deal with the gaps? How will educational programs that do not have clearly stated goals, competencies, or objectives? What other positive items can come from the alignment that has not been considered? Software with the following capabilities was needed to enhance the chances of effective alignment and implementation:

- Includes an alignment tool that allowed easy input of data files;
- Accommodates the national Career Cluster standards;
- Accommodates external standards such as ASE, Print Ed, or AWS;
- Provides design tools to help change/modify competency statements;
- Is adaptable to Missouri curriculum language;
- Relies upon research tested curriculum design principles;
- Helps teachers moved from an instruction focus to a learner focus;
- Is future focused and addresses assessment of the aligned course;
- Provides assistance in articulation and dual credit negotiations;
- Does not dictate how competencies should be taught;
- Allows for data collection, analysis, and reporting; and
- Is relatively easy to learn and use.

Those criteria were found in World Wide Instructional Design (WIDS). WIDS brings much more to the alignment and clusters implementation process than first thought, and its use is highly recommended. Not only does WIDS provide the tool for aligning knowledge and skills with course competencies, it contains a verb library based on Bloom's Taxonomy which identifies the domain and level of thinking for each verb, standard libraries for many of the nationally-identified standards (i.e. NCLEX, ASE), and will produce instructor-composed syllabi that are consistent. WIDS also contains a program design element that brings multiple courses together into one program by linking outcomes, measures and external standards. Program design shows how everything within a program is aligned. This feature helps facilitate accreditation processes by showing how outcomes are measured and how standards are met within a program.

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