Programs of Study 10-Step Process

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Produced by the Missouri Center for Career Education at the University of Central Missouri for the Missouri Department of Elementary and Secondary Education.

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PROGRAMS OF STUDY

WHAT

The primary purpose of Programs of Study is to provide successful student transitions between secondary and postsecondary education. The Carl D. Perkins Career and Technical Education Improvement Act of 2006 called upon states and local education agencies to create secondary-to-postsecondary sequences of academic and career education coursework that lead students to attain a postsecondary degree or industry-recognized certificate or credential. At a minimum, Programs of Study must:

- incorporate and align secondary and postsecondary education elements;
- include academic and CTE content in a coordinated, non-duplicative progression of courses;
- offer the opportunity, where appropriate, for secondary students to acquire postsecondary credits; and
- lead to an industry-recognized credential or certificate at the postsecondary level, or an associate or baccalaureate degree.

WHY

- Smoother transitions for students as they move from secondary to postsecondary education and into the workforce. This helps students avoid pitfalls that tend to derail their career plans, waste tuition money and frustrate their parents.
- Opportunities for teachers at all levels and subjects to collaborate on curriculum, methods and desired outcomes of instruction. The process empowers teachers by allowing them to design effective and efficient instruction that helps their students achieve their goals.
- Students who have goals and a plan to achieve them are more invested and motivated in their studies.

HOW

The development of Programs of Study is a collaborative effort among schools and colleges to seamlessly coordinate classroom instruction and support experiences and activities for a particular career cluster or pathway, which includes career and technical student organizations, career development and guidance, and community participation. It is built upon a curriculum that addresses cluster/pathway knowledge and skills, as well as national and state academic standards.

Development of Programs of Study can be accomplished by:

- Contacting your Tech Prep Coordinator for assistance.
- Utilizing the *10-Step Process to Implement Programs of Study in Missouri.*
- Reviewing and completing the appropriate Programs of Study Implementation Modules.

WHO

Who should be involved in the process?

- District curriculum directors
- Career education directors
- Career education teachers
- High school principals
- Academic teachers
- Guidance counselors
- Community college faculty and administrators

For more information, contact:

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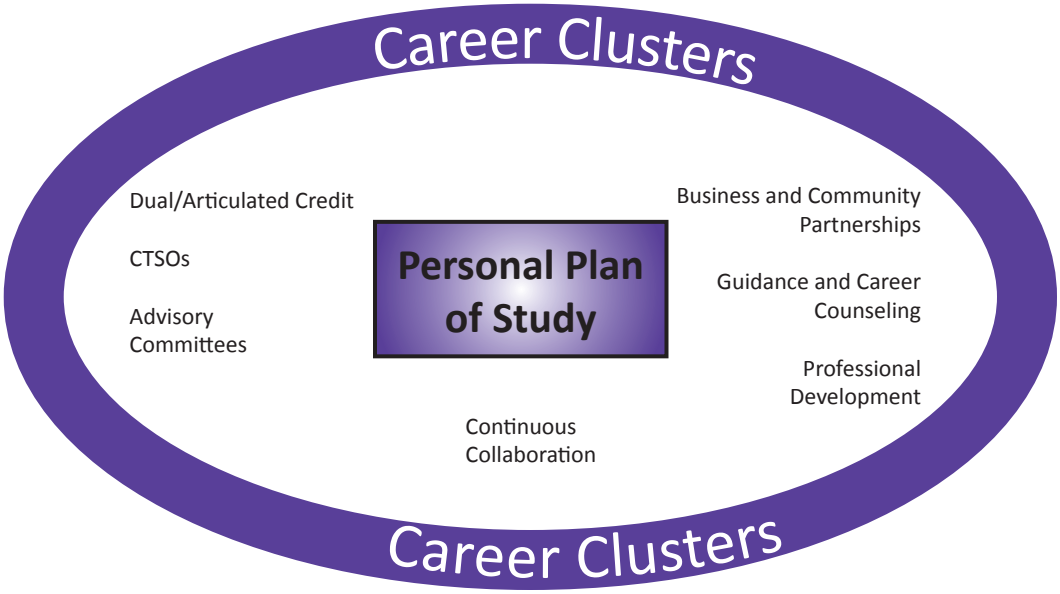
Missouri Career Education
ESSENTIAL SKILLS FOR ALL STUDENTS

DESE 3120-17 4/10

The program of study is designed to help the student more effectively devise a personal plan and maintain a process of continuous improvement around the plan.

The Relationship of Career Clusters and Programs of Study



The national Career Clusters Framework provides the organizational structure for developing programs of study. The framework incorporates essential foundational knowledge and skills, cluster knowledge and skills, and pathway knowledge and skills and functions as a tool for developing model personal plans of study. Because the career clusters knowledge and skills encompass secondary and postsecondary education, the framework informs institutional efforts to strengthen transitions from secondary to postsecondary education. Curricula organized with the Career Clusters Framework results in an efficient, effective, and streamlined program of study. Missouri selected the career clusters framework for high schools, colleges, and universities to organize and implement programs of study at the local level.

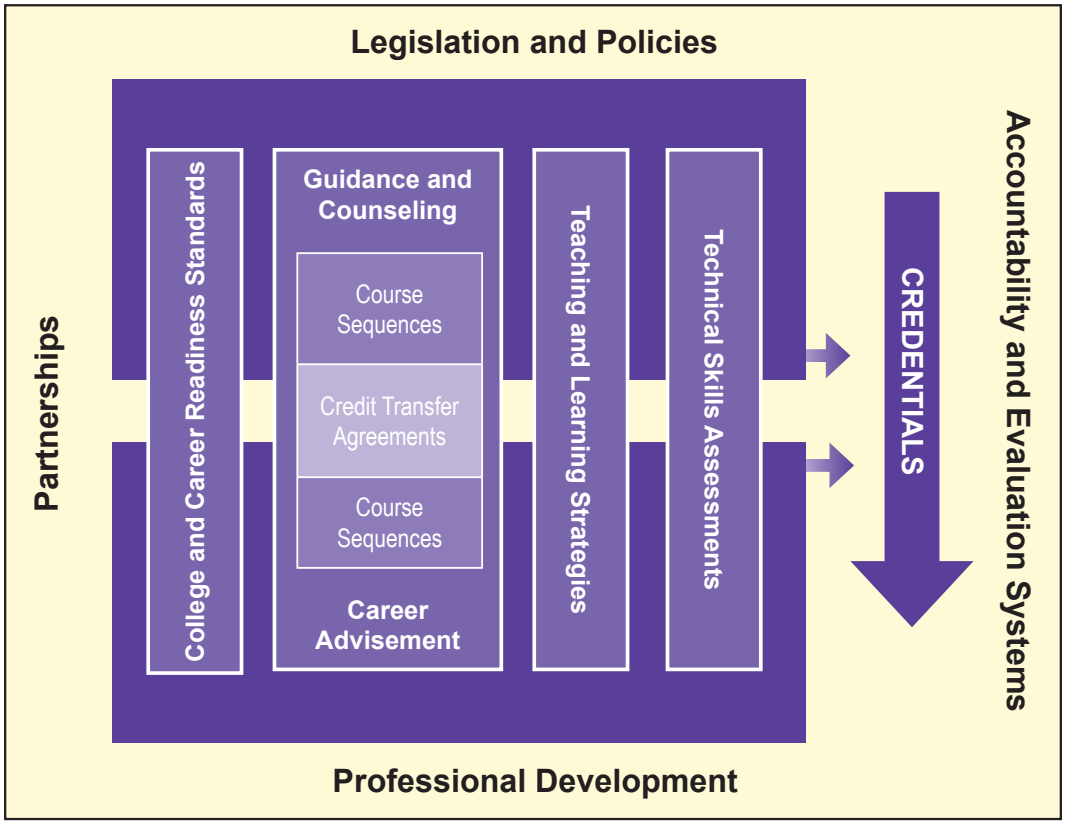
Within the Perkins Act, there are no references to "career clusters." Similarly, within the States' Career Cluster Initiative, references to the Perkins Act or "programs of study" are infrequent. Where the Career Clusters Initiative materials do refer to programs of study, the term denotes a sequence of courses that forms the basis of a plan of study. Missouri, however, defines a program of study as representing not only a sequence of courses, but also comprising all of the supporting institutional activities associated with a sequence of courses to establish a streamlined, rigorous, non-duplicative transition to postsecondary education or workplace training. The program of study is designed to help the student more effectively devise a personal plan and maintain a process of continuous improvement around the plan.

Programs of study and personal plans of study are related but are not synonymous. A program of study is a collaborative effort among schools and colleges to seamlessly

Programs of study and personal plans of study are related but not synonymous.

coordinate classroom instruction, student guidance, career and technical student organizations, career development and community participation for a particular career cluster or career pathway. The program of study process yields a seamless system of career exploration, preparation, and skill instruction linked to academic credits and credentials, available with multiple entry and exit points spanning middle school, high school, postsecondary institutions, adult education, and workplace training. The derivative of the process, a student's personal plan of study, reflects a program of study individualized for that particular student's career interests. The school clubs and community activities incorporated into a personal plan of study can provide the student practical experience to hone skills learned in the classroom and to develop personal qualities such as leadership and teamwork.

OVAE Program of Study Design Framework



Implementation of a program of study builds upon a curriculum that addresses the cluster knowledge and skills and pathway knowledge and skills, as well as national and state academic standards. Standards-based curricula moves 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.

Horizontal alignment of local curriculum and the Career Clusters Framework essentially becomes a gap analysis between course content and the framework's knowledge and skills. Local decisions focus on how the 'gaps' in the curriculum should be addressed. Vertical alignment between secondary and postsecondary coursework follows the horizontal alignment. This alignment provides a basis for articulation and/or dual credit arrangements in which students experience a seamless transition into postsecondary education. Once completed, the horizontal and vertical alignment facilitates development of model personal plans of study.

Institutional activities to support programs of study include guidance and career counseling for students, instructor professional development, career and technical student organization activities, work-based learning opportunities, as well as changes within the school system to aid implementation of the program of study.

Elements of a POS

- Dual credit/ Concurrent credit options
- Secondary & Postsecondary curriculum coordination
- Non-duplicative progression of courses
- Coherent, rigorous course content
- Challenging academic content aligned with technical content
- Transition strategies promote student success
- Industry-recognized credential and/or associate or baccalaureate degree

...it is important to note several key understandings.

The Critical Component Self-Assessment can be used to determine progress toward implementation.

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 State Plan for Career Education to accompany and support a personal plan of study. Step 10 provides some guidance with this component.

Before examining the steps to implement the process, it is important to note several key understandings. 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; then, incorporate the beginnings of the second component when team members feel it is appropriate.

Time is an important element. Due to possible curricular changes and curriculum committee requirements, it may take a consortium 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, 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 *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.

Application of Missouri's Seven Core Concepts for Career Clusters informed development of the 10-step process. 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.

Key Concepts:

- The sequence of courses represented in a model program of study do not have to be completed prior to offering activities that support those courses.
- Timing is everything.
- Alignment should begin at the postsecondary institution level.

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 elements is the identification of multi-level educational participants. It is recommended that key partners include the following representatives:

Advisory Level Participants

- Four-year baccalaureate degree institution 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
- Parents
- Counselors

Implementation Team Level Participants

- Four-year baccalaureate degree institution faculty
- Community college faculty
- School district faculty (including both career-technical faculty and academic faculty)
- Career center faculty

The first step in the program of study process 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 processes, 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 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 advisory level participants 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, advisory level participants 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 advisory level participants receive additional training at the same time as 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.

Selecting A Cluster:

When selecting a cluster for the program of study process, consider:

- Common programs.
- Innovative and flexible partners.
- Programs that need upgrading.
- Programs that fit with local economic development efforts.
- Programs that meet high wage, high demand criteria.
- Programs that offer a credential and/or certification.

Business, Management and Technology Workshop
XYZ City
AGENDA
November 20, 2009

7:30 a.m.	**Continental Breakfast**	XYZ Room
8:00 a.m.	**I. Career Clusters?** What are they? How do they work? Why are they important?	Mr. ABC, XYZ College
9:00 a.m.	**II. Programs of Study** What they are. Why they are needed. Connection to TSAs	Mr. MNO, INC Institute
	Break	
10:10 a.m.	**III. Best Practice (an example in excellence)** Focus on process	Ms. Doe, HIJ Center
11:00 a.m.	**IV. Conversations on Getting There / Depth of Knowledge** Break out to Rooms ABC, BCD and CDE	Facilitators
12:00 Noon	**Pick up Boxed Lunches**	
	Drop off evaluations and timelines	
	Adjourn	

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 the program of study process. In Step 2, the Implementation Team is expanded to include content specialists for the cluster chosen for implementation as well as participants identified in Step 1.

Secondary content specialists will perform an alignment between their course content, objectives and competencies for the secondary courses and programs. Postsecondary content specialists 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.

Suggestions From Practitioners:

- It's not just a career-technical education Implementation Team - include academic education.
- Continuously involve the upper level administration from the participating schools.
- Use data to build a case for participation in the program of study process (i.e., use of research data to support the reduced need for remediation at the postsecondary level).

Step 3: Foundational Professional Development

Although previously mentioned, the importance of 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 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 -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.

Suggestions From Practitioners:

- Design professional development around the theme of how the program of study process benefits the students.
- Schedule professional development to occur when the participants are ready to hear the message.
- The professional development modules on the MCCE Program of Study e-Learning Center website are a wonderful resource.
- Focus on eliminating the differences between high school and college.

Step 4: *Alignment of CTE Course Competencies with Knowledge and Skills*

Program of study implementation is built upon curricula that address the career cluster knowledge and skills, essential 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 informative part of implementing a program of study process. 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. Alignment tools have been developed to assist with this process (Cluster Alignment Table) and are available on the MCCE Program of Study e-Learning Center website.

A Word About Competencies

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 many times, 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.

*The term "competencies" is used in this document. However, the term is interchangeable with measurable learner objectives, learner outcomes, objectives, learning targets, etc.

The alignment process may be the most informative part of implementing a program of study process.

For the secondary level, the alignment process crosswalks course and/or program competencies with the essential (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 sample indicators, it will be important for the institution to determine whether a course competency aligns more appropriately with the knowledge and skill statement, performance element or sample indicator. Alignment of competencies is recommended with the sample indicator, and the Cluster Alignment Table has been prepared for each of the clusters in this fashion.

Cluster: Human Services
Pathway: Early Childhood Development
Knowledge, Skills & Services Statements

Pathway Knowledge and Skill	Early Childhood Development														
High School:	Course Name/Number and Grade Level, if applicable												Other		
Instructor(s):	K&S Achieved												CTSO/ Extracurricular	Academic	Rating*
Performance Element (HMPA01.01.04): Meet state-specific early childhood requirements for employment.															
Communications (HMPA02)															
Statement (HMPA02.01): Describe and use grammatically correct English to enhance learning, direct behavior, and strengthen classroom management.															
Performance Element (HMPA02.01.01): Engage children in meaningful and developmentally appropriate conversations to enhance learning and direct behavior.															
Sample Indicator (Measurement Criteria): Confirm that children understand and respond by following directions.															
Performance Element (HMPA02.01.02): Support curriculum development and classroom management by engaging in meaningful conversations with parents and children.															
Sample Indicator (Measurement Criteria): Confirm that children seek information, ask questions, and engage in conversations with adults.															

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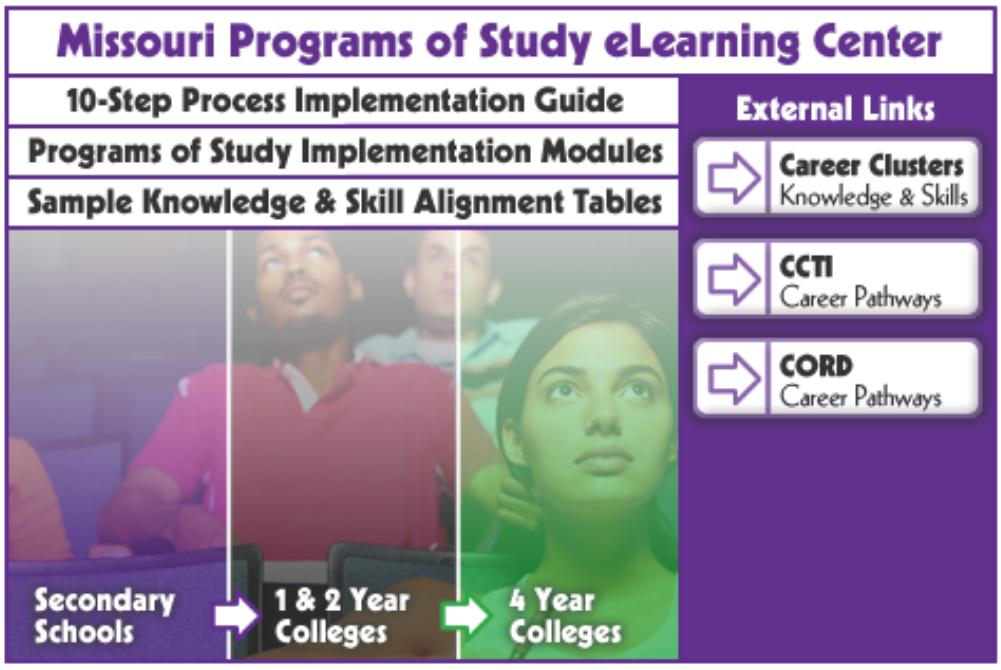
To use the Cluster Alignment Table *(See previous page)*, course competencies should first be placed in the column headers on the table. Then, sample indicators (listed down the left side of the form) included in the curriculum should be noted by placing an X within the box coinciding with the competency and sample indicator. Once all sample indicators under a performance element have been addressed, the performance element box should be checked. All sample indicators 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 sample indicator is not checked (and therefore the corresponding performance element and statement cannot be checked). Gaps further are addressed in Step 5.

Sample indicators from the clusters and pathways are not always addressed in courses. Some 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 sample indicators that are included in academic course content, the alignment team should collaborate with academic course

POS e-Learning Center



Reinforcing academic skills within CTE coursework ensures that students have the opportunity to learn those skills.

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 sample indicators or performance elements. See the MCCE Program of Study e-Learning Center for sample alignment tables.

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.

Suggestions From Practitioners:

- Since it is possible that both institutions teach the same competencies, but to a different degree, consider using a rating sheet to indicate the depth of knowledge addressed for each competency at both institutions.
- Alignment should be to consistent standards.
- Make sure to align what is taught to what is assessed.
- Technical Skill Assessments should drive the process.

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 courses, 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 curricular adjustments to include 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.

Suggestions From Practitioners:

- Get all instructors involved when discussing gaps.
- Samples of workplace tasks can be a good discussion vehicle for addressing gaps. This is a good way to get employers involved.
- Consider this as the jumping off point for developing assessments for dual/concurrent enrollment.

Cluster: Human Services
Pathway: Early Childhood Development
Knowledge, Skills & Services Statements

Pathway Knowledge and Skill	Early Childhood Development															
High School:	**Course Name/Number and Grade Level, if applicable**													**Other**		
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A Blank Box Indicates a Gap.

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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 sample indicators 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 transitional 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.

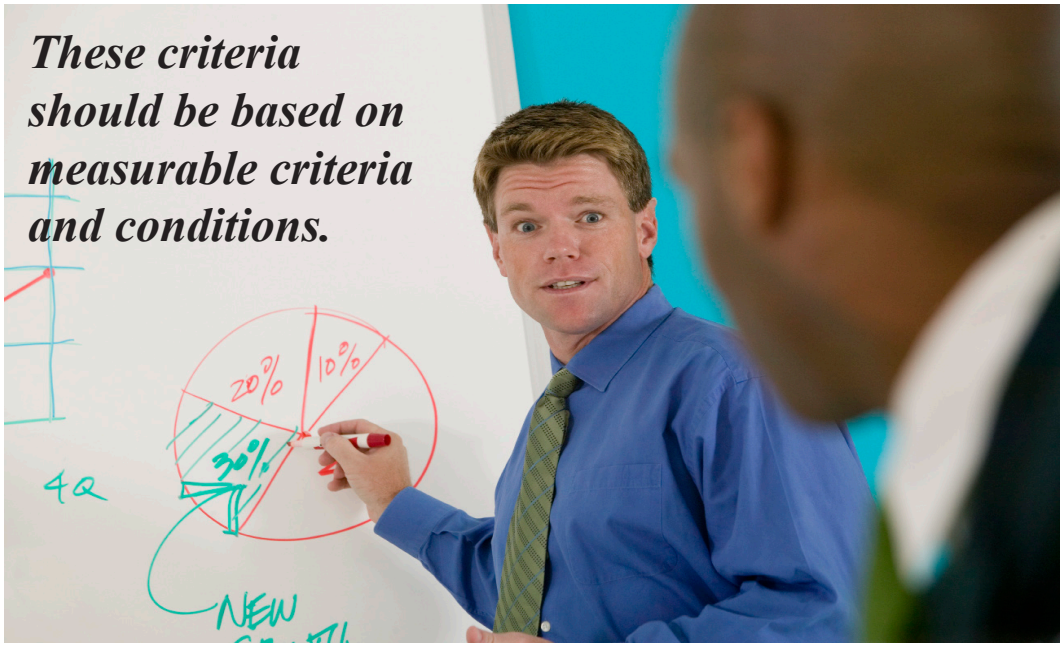
Suggestions From Practitioners:

- Reach agreement (a shared understanding) about the general level of knowledge and skills required for a course before awarding credit to students. This agreement should be consistent with all consortia members and measurable.
- One thing to consider when creating the vertical alignment is to not just looking at course content but helping secondary students develop the work habits and thinking skills expected in postsecondary coursework.
- The secondary course offerings should be progressively more challenging, with the senior year being the most challenging of all.

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 sample indicators are at a higher level (according to Depth of Knowledge, 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, schools 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. 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.

An Essential Element: Comprehensive Guidance

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 College and Career Readiness Standards;
- 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 State Plan for Career Education.

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.

The Missouri Perkins Technical Assistance Visit Rubric (See following pages) outlines and defines the elements of a successful program of study. A review of this document 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 State Plan for Career Education 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.

Checklist for Development and Implementation of Programs of Study

Perkins Grant Recipient District: **Due Date: June 30, 2010**

Program of Study:

On an annual basis, the Division of Career Education is required to report to the U.S. Department of Education on the progress of development and implementation of programs of study. The following checklist will provide the Division with information needed for the annual report, as well as provide a way to monitor where additional technical assistance might be needed.

This checklist is based on the *10-Step Process to Implement Programs of Study (POS) in Missouri* that was developed by the Missouri Center for Career Education in conjunction with the Tech Prep consortiums.

Step 1 - Commitment and Cluster Choice	**Check one:**				
	Start	Planning	In Progress	Nearly complete	Complete
All multi-level educational partners have been identified. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Buy-in has been obtained by all partners as evidenced by their participation. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Step 2 - Implementation Team Identification and Formation	**Check one:**				
	Start	Planning	In Progress	Nearly complete	Complete
An implementation team has been identified and schedules regular times for planning and development. Action Taken:	☐	☐	☐	☐	☐

Action Needed:					
Timelines have been set by the implementation team. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Step 3 - Professional Development	**Check one:**				
	Start	Planning	In Progress	Nearly complete	Complete
All team members have received inservice on career clusters, programs of study, personal plans of study, knowledge and skill statements and their benefits. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Other appropriate professional development needs have been identified. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Step 4 - Alignment	**Check one:**				
	Start	Planning	In Progress	Nearly complete	Complete
Crosswalk course competencies to the knowledge and skill statements, performance levels and measurement criteria within a cluster. Action Taken:	☐	☐	☐	☐	☐

Action Needed:					
Using a cluster alignment table, determine the gaps between the competencies and the knowledge and skills. Action Taken: Action Needed:	☐	☐	☐	☐	☐
At the secondary level, crosswalk course/program competencies with the cluster level (foundation) knowledge and skills and pathway knowledge and skills, where appropriate. Action Taken: Action Needed:	☐	☐	☐	☐	☐
At the postsecondary level, crosswalk competencies with both cluster-level and pathway-level knowledge and skills. Action Taken: Action Needed:	☐	☐	☐	☐	☐
The educators conducting the alignment collaborate with academic course instructors to confirm the inclusion of the knowledge and skill statements, performance levels and measurement criteria in the course content. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Address postsecondary remediation concerns by conducting an	☐	☐	☐	☐	☐

additional alignment within academic content. Action Taken: Action Needed:					
Step 5 - Gap Identification and Remedy	**Check one:**				
	Start	Planning	In Progress	Nearly complete	Complete
The alignment gaps have been resolved by determining where or at what depth of knowledge each student will learn the knowledge and skills for the chosen cluster. Action Taken: Action Needed:	☐	☐	☐	☐	☐
If necessary, course descriptions and pre-requisites have been revised. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Step 6 Local Validation and Credentialing	**Check one:**				
	Start	Planning	In Progress	Nearly complete	Complete
Results have been shared with the local advisory committee for the purpose of conducting a local validation of updated, nationally-aligned course competencies. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Advisory committee has reviewed corrections resulting from the	☐	☐	☐	☐	☐

gap analysis and endorses appropriate opportunities for students to receive industry credentials. Action Taken: Action Needed:					
Advisory committee members may add knowledge and skill statements. If these are added, appropriate performance elements and measurement criteria need to be included. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Step 7 - Vertical Alignment and Transition Links	**Check one:** Start	Planning	In Progress	Nearly complete	Complete
Vertical alignment has been performed by comparing courses that link programs between educational levels: secondary to two-year, secondary to four-year, and two-year to four-year to insure congruency in student matriculation. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Step 8 - Transition Opportunities	**Check one:** Start	Planning	In Progress	Nearly complete	Complete
Criteria for successful articulation has been determined based upon measurable criteria and conditions by establishing performance elements and measurement criteria at higher levels within higher numbered courses using Bloom's Taxonomy in order to substantiate course rigor and resolve concerns about duplication.	☐	☐	☐	☐	☐

Action Taken: Action Needed:					
Competencies have been revised so that course outcomes link. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Alignment tables have been updated to represent the most current course and cluster content. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Step 9 - Create Personal Plan of Study	**Check one:**				
	Start	Planning	In Progress	Nearly complete	Complete
Using the Missouri model personal plans of study, model plans of study have been created for district use that incorporate all of the required elements. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Graduation requirements are met and course sequencing is appropriate to avoid remediation at postsecondary institutions. Action Taken: Action Needed:	☐	☐	☐	☐	☐

Occupations and skill levels attained at appropriate exit points have been identified. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Secondary PPS designs 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 skills in a chosen Career Cluster; Provide opportunities for learners to earn college credit through credit-based transition programs. Action Taken: Action Needed:	☐	☐	☐	☐	☐
Step 10 - Environment of Continuous Improvement	**Check one:**				
	Start	Planning	In Progress	Nearly complete	Complete
An environment of continuous improvement has been created by: Setting goals for reducing student remediation and increasing successful student transitions. List goals and target dates for completion:	☐	☐	☐	☐	☐
Creating activities/services/policies within each institution to sustain the effort.	☐	☐	☐	☐	☐

Action Taken: Action Needed:	
Next Steps	
What is your timeframe for transitioning existing programs to Programs of Study?	

Glossary

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 sub groupings 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.

Community Packet

Competency Packets are a collection of documents focused on the elements necessary for the establishment and/or operation of a career education program. Based on Career Cluster Pathways, the packed includes an introduction, a program overview for teachers, a program overview for students, core competency list(s), alignments of the competencies with appropriate standards, a sample personal plan(s) of study, a student core competency attainment spreadsheet/rubric, and a relevant instructional resources list.

Community 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.

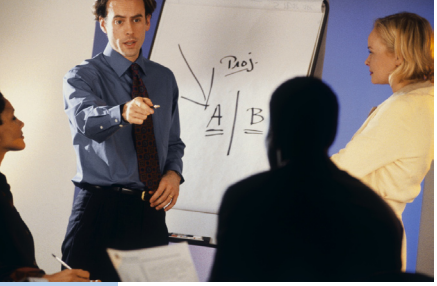
Course Expectations

The Course Expectations documents are used to inform and develop End-of-Course exams in Mathematics, Communication Arts, Science and Social Studies. They describe what a student should know and be able to do in these subject areas in grades nine through twelve.
From the DESE website at http://dese.mo.gov/divimprove/assess/eoc.html

The Missouri Assessment Program assesses students' progress toward mastery of the Show-Me Standards which are the educational standards in Missouri. The Missouri Assessment Program includes required End-of-Course assessments in the subject areas of Algebra I, Biology, English II and Government. Additional End-of-Course assessments are available at no charge to the district in American History, English I, Algebra II and Geometry. End-of-Course assessments are taken when a student has received instruction on the course-level expectations for an assessment, regardless of grade level. All EOC assessments are available both online and in paper/pencil formats.

Essential Knowledge & Skills

Knowledge and skill statements that are essential to success for careers in all clusters.



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

Programs of study are a means of providing 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.

Missouri has developed a framework and process for secondary and postsecondary education to implement programs of study. The framework includes a full range of activities, documents and processes that can be incorporated across the state at the local level. Each program of study includes a three-part curriculum framework built around a 4 + 2 (+2) articulation model.

A program of study process 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.

Program of Study (Continued)

- 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, a program of study process will include:

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.

Program of Study (Continued)

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.

The POS Process Includes:

Technical Skill Assessment

National, state, and/or local assessments that provide ongoing information on the extent to which students are attaining the necessary knowledge and skills for entry into and advancement in postsecondary education and careers in their chosen personal plan of study.

Appendices

Appendix A
Articulation or Dual Credit?

The question often arises about which option, articulation or dual credit, is best for students. Nationally, there is a trend toward offering 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 requires both secondary and postsecondary involvement in continuous review of course revisions. Without continuous course review to ensure alignment, students may require remediation to be successful at the postsecondary level. This affects student success in subsequent higher-level coursework and student completion rates.

Dual Credit Programs

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.

Appendix B
Programs of Study in Missouri

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

Appendix C
Computer Software

Early in the planning stages of the 2007 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 features 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.

Appendix D
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