## Final Report for the National Center for Intermodal Transportation for Economic Competitiveness

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#### ABSTRACT

*Education Outreach for Intermodal Transportation – Moving minds at the speed of time* was instrumental in introducing high school students to logistics and intermodal transportation in Mississippi. The state lacked a presence in logistics and intermodal transportation for secondary students. The Mississippi Department of Education identified two school districts, Jackson Public Schools and Desoto County Schools, as pilot sites to begin instruction in this transportation pathway. A statewide curriculum was developed and implemented for secondary teachers to teach the concepts of logistics and intermodal transportation. Students were introduced to statewide transportation issues, different modes of transportation, federal and state requirements, and many other transportation- and logistics-related strategies.

Teacher training and development, the design and production of resource materials, and curriculum development were primary objectives of the project. Participating teachers developed lesson plans infusing intermodal transportation experiences into the curricula. Opportunities for teachers to utilize industry resources as well as use materials developed through the grant were key for the pilot sites to be successful.

Teachers are now better prepared to become ambassadors of intermodal transportation in the K-12 education environment and deliver the Mississippi Career and Technical Education Logistics curricula. Secondary teachers participated in a national logistics conference, acquired resources towards certification, interacted with other logistics professionals from Institutions of Higher Learning, and toured intermodal transportation business/industry sites for a better understanding of what intermodal transportation and logistics were all about.

The RCU designed and produced marketing materials for classroom and recruitment use. These materials will be excellent resources for teachers to use in educating students and parents about intermodal transportation and the logistics field. All training, resources, and knowledge gained in the pilot can now be scaled up to any school in Mississippi to develop a sustainable pipeline of workers in this field.

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#### **INTRODUCTION**

Transportation continues to be the life blood of the United States economy as well as the global economy (2). It can be postulated that any measures to make transportation an easier, yet more efficient, process only benefits those involved. Intermodal transportation seeks to do just that.

Bragdon defines intermodal transportation to be "the safe and efficient integrated movement of people, goods, and information involving air, land, and sea in a four dimensional virtual environment" (1). The United States Department of Transportation defines it as "the convenient, rapid, efficient, and safe transfer of people or goods from one mode to another (including end-point pick-up and delivery) during a single journey to provide the highest quality and most comprehensive transportation service for its cost." (4) Graham et al. defines it as "an attempt to incorporate all modes of transportation" and "the shipment of cargo and the movement of people involving more than one mode of transportation during a single, seamless journey" (3).

There have been key developments in creating an intermodal transportation system. The first major step to this goal was taken by the United States Government. In 1991 the Intermodal Surface Transportation Efficiency Act which stated that "it is the policy of the United States Government to encourage and promote development of a national intermodal transportation system in the United States to move people and goods in an energy efficient manner, provide the foundation for improved productivity growth, strengthen the Nation's ability to compete in the global economy, and obtain the optimum yield from the Nation's transportation" (*3*). The second development of origin without interim handling again until the container arrives at its ultimate destination and is unloaded by the consignee. A container may be transported as a single unit by motor, rail, water, or air carriers with a substantial reduction in transit time, expense, loss, damage, and theft from that experienced under traditional breakbulk carriage" (Graham, Cassady, Bowden, & Lemay). Several cities and metropolitan areas are incorporating intermodal transportation using buses, automobiles, trains, and airport connections (*4*).

#### **OBJECTIVES**

All activities were focused around the accomplishment of the following four objectives:

- 1. Develop new career and technical education Logistics curriculum
- 2. Provide training to Logistics instructors
- 3. Design and produce marketing materials
- 4. Evaluate the implementation of the Logistics curriculum and the effectiveness of the teacher training

#### SCOPE

The new Logistics program will prepare individuals to manage and coordinate all logistical functions in an enterprise, ranging from acquisitions to receiving and handling, through internal allocation of resources to operations units, to the handling and delivery of output. The curriculum includes instruction in acquisitions and purchasing, inventory control, storage and handling, just-in-time manufacturing, logistics planning, shipping and delivery management, transportation, quality control, resource estimation and allocation, and budgeting. It also includes instruction in transportation systems and technologies; multi- and intermodal-transportation systems; transportation planning and finance; demand analysis and forecasting; carrier management; behavioral issues; transportation policy and law; intelligent systems; and applications to aviation, maritime, rail, and highway facilities and systems.

Training was provided by collaborating with the University of Southern Mississippi, the University of Memphis, as well as on-site industry visits to intermodal-transportation companies. The workshops provided secondary instructors relevant and practical knowledge on logistics concepts, transportation, and intermodal facility functions to K-12 students. The workshop modules were designed around the fundamental concepts of intermodalism, impact of intermodalism in transportation and economy, future perspectives of intermodal transportation professionals, and lean concepts. The workshops shared resources and best practice examples to develop rigor and relevance in the high school curriculum. Participant activities included developing sample lesson plans, providing an overview of the various intermodal transportation, logistics and supply chain activities, and career development opportunities that can be used in the classroom.

Partnering with industry was vital to the success of this pilot. Visits to intermodaltransportation industries allowed teachers access to the most current technology and to experience firsthand what intermodal transportation is. Teachers collaborated with industry leaders and received invaluable knowledge that they can now share with their high school students.

A descriptive intermodal-transportation brochure for teachers to use for student recruitment and parent information was designed and produced for the new Logistics program.

Evaluation of the new curriculum's implementation was conducted by school administrators, as well as through classroom observations by the Principle Investigator. Qualitative evaluation also occurred as to the effectiveness of the industry site visits and verbal feedback

was collected after each IHL-provided workshop. The RCU will continue to gather feedback to understand obstacles and best practices as this new logistics initiative grows.

#### METHODOLOGY

The research methodology required gathering observational and self-report data from the logistics teachers at the two pilot schools. Both being first-time teachers, and due to a total population size of two, it was determined that the best indicator of success was 1) for the PI and school director/principal to watch the teacher conduct class and compare the rubric results; 2) allow the teacher to rate themselves on a self-efficacy scale that reported teacher satisfaction; 3) get verbal feedback after industry site visits as well as conference attendance.

#### Data Collection

Data collection consisted of surveys, classroom observations, and discussions with the two teachers as well as their administrators. The *Teachers' Sense of Efficacy Scale* (long form) is a 24-item survey instrument developed at The Ohio State University to measure teacher satisfaction regarding their performance in the classroom. The *NCITEC CTE Teacher Observation Classroom Checklist* is a 20-item observational rubric used by Southern Regional Educational Board (SREB) and used by permission to train Mississippi teachers.

Multiple discussions occurred with each teacher and their administrators to provide more indepth understanding and opportunities for follow-up. Using such a qualitative approach will add value to future Career and Technical Directors willing to start a logistics program.

The research from this project will become an asset to new program administrators. As for my own experience with this undertaking, I have gained tremendous insight into the opportunity to implement new logistics programs within the state and what resources are available to new teachers.

#### **DISCUSSION OF RESULTS**

The results indicate that the implementation of a logistics program has been successful at the two pilot sites. Feedback from teachers, school administrators, and the PI all confirm that students do like the new program. Survey data also suggests that both teachers feel quite comfortable with their roles. Survey data from school administrators and the PI observing classroom teaching confirm that the teachers are following through with the competencies of the new curriculum. All feedback indicates a high level of satisfaction by both the teachers and their administrators of this new program.

#### CONCLUSIONS

The conclusions that can be drawn from this initiative are far reaching. Mississippi was lacking a logistics presence at the high school level. Therefore, monies provided through the grant allowed implementation on a level that otherwise would not have been possible. As stated, the objectives included:

- 1. Develop new career and technical education Logistics curriculum.
- 2. Provide training to Logistics instructors.
- 3. Design and produce marketing materials.
- 4. Evaluate the implementation of the Logistics curriculum and the effectiveness of the teacher training.

All curriculum material, training material, marketing material, and evaluations have taken place and available for use in developing new logistics programs. All feedback indicates that intermodal transportation and logistics is a viable program that can be taught at the high school level. Through a strong cooperation between the two pilot school districts, The Mississippi Department of Education, partnering Institutions of Higher Learning, participating industries, and The Research and Curriculum Unit, the initiative was regarded as highly successful.

#### RECOMMENDATIONS

All indications are that starting a logistics program in a Mississippi high school is a good use of available time and resources. Strong local support is necessary to insure the right teacher gets hired and that the district will fully support the initiative. Also, given the current qualitative data available, new program directors will have available to them much more information to make better, more comprehensive decisions. As more emphasis is placed on the movement of goods teaching tomorrow's workforce is vital to the state's economy. Consequently, efforts toward preparing high school students for good paying jobs in the transportation area should be taken.

#### REFERENCES

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- 4. U.S. Department of Transportation. (1996). *Intermodal Surface Transportation Efficiency Act; flexible funding opportunities for transportation investments*. http://ntl.bts.gov/lib/jpodocs/rept\_mis/6583.pdf. Accessed May 1, 2012.

## APPENDIX

The following attachments are the survey instruments used for this project.

Teacher #1

NCITEC CTE Teacher Observation Classroom Checklist

Teacher's Name: Observer's Name:

Administrator

Date: <u>12/13/13</u>

Course: Transportation Logistics

Instructions: Place a ( $\checkmark$ ) in the appropriate box.

I. Plar	nning and Preparation	Unsatisfactory	Basic	Proficient	Distinguished
	and accurate management of the second of t				
b.	Teacher displays knowledge of interests of students [FFT1b]				$\checkmark$
	r in faith a faith 2 t. The new second second states in the second second second second second second second s Scale is a single of the second se				a ta si dan di Sana a si dagi di 1994.
d.	Instructional goals include: (circle all that apply)	Technical content   A	cademic	content   21 <sup>s</sup>	<sup>t</sup> Century skills
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b.	The lesson, interactions and classroom environment convey clear expectations for positive student behavior [FFT2b]	5			· 🗸
	and an and a second design of the second second Second second second Second second	A			
d.	Teacher uses appropriate interventions to respond to unwanted behavior and respects the student's dignity, or student behavior is generally appropriate [FFT2d]			√	
f.	The physical space includes motivational displays (circle all that apply):	Student work	Career-Co	urse content	connections
		CTSO information   I	Recognitio	n of student	achievements
ili. Ins	struction				
j a.	time is available for students to respond [FFT3b]				✓
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C.	Representation of content is appropriate and links well with students' knowledge and experience [FFT3c]				✓
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e.	Teacher provides students with feedback that is accurate, specific, constructive and timely [FFT3d]				$\checkmark$
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g.	A variety of active engagement strategies are employed			~	
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i.	Teacher integrates academic content with career/technical content (circle all that apply)	Re	eading	Writing   M	athematics
		le All Constant of P	lan   Crea	te Sumarza	Analyze
		Solve	roblems	Make decisi	ons Apply

# Teacher #1

	Teacher Beliefs How much can you do?									
	Directions: This questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.	Nothing		Very Little		Some Influence		Quite A Bit		A Great Deal
1.	How much can you do to get through to the most difficult students?	(1)	(2)	(3)	(4)	(5)	(6)	<b>(2</b> )	(8)	(9)
2.	How much can you do to help your students think critically?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(B)	<b>(2</b> )
3.	How much can you do to control disruptive behavior in the classroom?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	6)	(9)
4.	How much can you do to motivate students who show low interest in school work?	(1)	(2)	(3)	(4)	(5)	(6)	(7)		(9)
5.	To what extent can you make your expectations clear about student behavior?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(Ø)
6.	How much can you do to get students to believe they can do well in school work?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Ø	(9)
7.	How well can you respond to difficult questions from your students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	630)
8.	How well can you establish routines to keep activities running smoothly?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	<b>(2</b> )	(9) <sup>.</sup>
9.	How much can you do to help your students value learning?	(1)	(2)	(3)	(4)	(5)	(6)	Ø	(8)	(9)
10.	How much can you gauge student comprehension of what you have taught?	(1)	(2)	(3)	(4)	(5)	(6)	٥	(8)	(9)
11.	To what extent can you craft good quest. your students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	69
12.	How much can you do to foster student creativity?	(1)	(2)	(3)	(4)	(5)		(7)	(8)	(9)
13.	How much can you do to get children to follow classroom rules?	(1)	(2)	(3)	(4)	(5)	(6)	(7)		(9)
14.	How much can you do to improve the understanding of a student who is failing?	(1)	(2)	(3)	(4)	(5)	<b>(£</b> )	(7)	(8)	(9)
15.	How much can you do to calm a student who is disruptive or noisy?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	٩	(9)
16.	How well can you establish a classroom management system with each group of students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Ø	(9)
17.	How much can you do to adjust your lessons to the proper level for individual students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	0
18.	How much can you use a variety of assessment strategies?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	٨
19.	How well can you keep a few problem students form ruining an entire lesson?	. (1)	(2)	(3)	(4)	(5)	(6)	(7)	<b>(2</b> )	(9)
20.	To what extent can you provide an alternative explanation or example when students are confused?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	南
21.	How well can you respond to defiant students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	<b>(</b> 2)	(9)
22.	How much can you assist families in helping their children do well in school?	(1)	(2)	(3)	(4)	(5)	(6)		(8)	(9)
23	How well can you implement alternative strategies in your classroom?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	۵
24	How well can you provide appropriate challenges for very capable students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Ø	(9)

## Teachers' Sense of Efficacy Scale<sup>1</sup> (long form)

Teacher #2

NCITEC CTE Teacher Observation	n
Classroom Checklist	

Observer's Name:       Ad A wisstacher       Course:       Immospheric Haller, Additional Haller, Addito Haller, Additional Haller, Additional Ha	Teacher's Name:	n in the second s	Date			
Instructions: Place a (*) in the appropriate box.       Unsetisfactory       Basic       Proficient       Distinguish         4. (escher displays binder and up of structure, solid scheduler, solid sched	Observer's Name:	1dministrator	Cour	se: Irm		nilla il
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student behavior is generally appropriate (FFT2d)       Image: Construction and Taboratory Space are order/wand support         1       The blassroom and Taboratory Space are order/wand support       Image: Construction and Taboratory Space are order/wand support         1       The blysical space includes mptivational displays       Student work (Career-Course content connections)         (circle all that apply):       Image: Course content connections         II. Instruction       Image: Course content connections)         a. Most of teacher's questions are of high quality and adequate time is available for students to respond (FFT3b)       Image: Course content connections)         b. The resconting a clearly derined structure of advittes and incleared struction is from phell to bell (FFT3c)       Image: Course content is appropriate and links well with students' knowledge and experience (FFT3c)         c. Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)       Image: Course content is appropriate and links well with students' or to the instructional grains of tables on (FFT3c)         c. Teacher provides students with feedback that is accurate, specific, constructive and timely (FFT3d)       Image: Course content is appropriate and for phele in the content is appropriate for experience in the content is appropriate and for phele in the content is appropriate and for phele in the content is appropriate for environ in the content is accurate, specific, constructive and timely (FFT3d)       Image: Content is appropriate in the content is accurate, specific, constructive and timely (FFT3d)       Image: Conten		nerventions to respond to		,		
end the Elasticome and faboratory space are interdentional support tearing (FFT2a) f. The physical space includes mptivational displays (circle all that apply): Student work (Carcer-Course content connections): CTSO information   Recognition of student achievements II. Instruction a. Most of teacher's questions are of high quality and adequate time is available for students to respond (FFT3b) b. The feedonias a dearly defined structure of antivities and it, well paced instruction in the appropriate and links well with students' knowledge and experience (FFT3c) c. Representation of content is appropriate and links well with students' knowledge and experience (FFT3c) d. Instructional groups are productive and fully appropriate for the instructional groups are productive and fully appropriate for the instructional groups are productive and fully appropriate for the students or to the instructional group are productives and fully appropriate for the students are for a time to respond (FFT3c) c. Teacher provides students with feedback that is accurate, specific, constructive and timely (FT3d) c. Teacher provides students with feedback that is accurate, specific, constructive and timely (FT3d) c. Teacher provides students with feedback that is accurate, specific, constructive and timely (FT3d) c. Teacher integrates academic dontent with career/technical (Reading: Writine) Mathematics of the instructional group assessment to the ending: Writine) Mathematics of the apply (Content with career/technical (Reading: Writine) Mathematics (Analyze Solve problem) (Career Southers) (Career Analyze Solve problem) (Career Analyze Solve pro	student behavior is general	vanconiate (EET2d)			LA .	
Identing (FEV2e)       Image: Student work (Career-Course content connections, (circle all that apply):         II. Instruction       CTSO information   Recognition of student achievements time is available for students to respond (FET3b)       Image: CTSO information   Recognition of student achievements time is available for students to respond (FET3b)         II. Instruction       Image: CTSO information   Recognition of student achievements time is available for students to respond (FET3b)       Image: CTSO information   Recognition of student achievements well paced instruction is from bell to bell (FET3c)         II. Instruction is appropriate and links well with students' knowledge and experience (FFT3c)       Image: CTSO information   CTSO information   Recognition of student achievements is students on the instructional goals of allesson (FFT3c)         II. Instructional students with feedback that is accurate, specific, constructive and timely (FFT3c)       Image: CTSO information   CTSO information   CTSO information   CTSO information   Recognition of achievements is appropriate and propriate for the instructional goals of allesson (FFT3c)         II. Students are engaged and experience (FFT3c)       Image: CTSO information   CTSO information   CTSO information   CTSO information   CTSO information   CTSO   CTS	er The classroom and laborato	Vispace are orderiv and support				
<ol> <li>The physical space includes motivational displays         (circle all that apply):</li></ol>	learning [FFT2e]			Z		
(circle all that apply):       Student work (Career-Course content connections         (circle all that apply):       CTSO information   Recognition of student achievements         a. Most of teacher's questions are of high quality and adequate time is available for students to respond (FFT3b)       Image: Connections         b. The fession/has a clearly defined/structure of activities and is and is a well-paced instruction is from theil to bell (FFT3c)       Image: Connection and the students is appropriate and links well with students' knowledge and experience (FFT3c)         c. Representation of content is appropriate and fully appropriate for the students or to the instruction ingoals of allesion (FFT3c)       Image: Constructive and timely (FFT3c)         d. Instruction and experience (FFT3c)       Image: Constructive and timely (FFT3c)       Image: Constructive and timely (FFT3c)         e. Teacher provides students with feedback that is accurate, specific, constructive and timely (FFT3d)       Image: Constructive and timely (FFT3d)       Image: Constructive and timely (FFT3d)         f. Students are engaged in regilies are employed       Image: Constructive and timely (FFT3d)       Image: Constructive and timely (FFT3d)       Image: Constructive and addition active assessment to theorem and the construction and the construction active assessment to theorem active assessment to the construction active active assessment to the construction active acting active construction active assessment to the constru	t. The physical space includes	mptivational displays				
III. Instruction a. Most of teacher's questions are of high quality and adequate time is available for students to respond (FFT3b) b. The design that a design of the	(circle all that apply):		Student work	areer-Co	urse content	connections
<ul> <li>a. Most of teacher's questions are of high quality and adequate time is available for students to respond (FFT3b)</li> <li>b. The resconthas a dearty defined structure of activities and it.</li> <li>c. Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)</li> <li>d. Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)</li> <li>d. Instructional groups are productive and fully appropriate to the students on to the instructional goals of a lesson (FFT3c)</li> <li>c. Teacher provides students with feedback that is accurate, specific, constructive and imply (FFT3d)</li> <li>c. A variety of active engagement strategies are employed</li> <li>d. A variety of active engagement strategies are employed</li> <li>c. Teacher integrates academic content with career/technical content (circle all that apply)</li> <li>c. Teacher integrates academic content with career/technical content (circle all that apply)</li> <li>c. Reading: Writing: Makedeelsion.</li> </ul>			SO information   Re	cognitio	n of student a	chievements
<ul> <li>a. Most of teacher's questions are of high quality and adequate time is available for students to respond [FFT3b]</li> <li>b. The resconthas a clearly definedistructure of antivities and is an investigation of content is appropriate and links well with students' knowledge and experience (FFT3c)</li> <li>c. Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)</li> <li>c. Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)</li> <li>c. Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)</li> <li>c. Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)</li> <li>c. Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)</li> <li>c. Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)</li> <li>c. Representation of content with feedback that is accurate, specific, constructive and timely (FFT3d)</li> <li>c. Teacher provides students with feedback that is accurate, specific, constructive and timely (FFT3d)</li> <li>c. A variety of active engagement strategies are employed</li> <li>c. Teacher integrates academic content with career/technical content (circle all that apply)</li> <li>c. Teacher integrates academic content with career/technical content (circle all that apply)</li> <li>c. Teacher integrates academic content with career/technical content (circle all that apply)</li> <li>c. Beading: Writing: Mathematics</li> <li>c. Solve problemp: Make/decisione LAngley is a properior of the apply is a properior of t</li></ul>	n. Instruction					
Unite is available for students to respond (FFT3b)       Image: Comparison of the students to respond (FFT3b)         b       The fession has a clearly defined structure of activities and is:         well paced instruction is from bell to bell (FFT3c)       Image: Comparison of content is appropriate and links well with students' knowledge and experience (FFT3c)         c       Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)         d. einstructional groups are productive and fully appropriate to the students on to the instructional graits of a lesson (FFT3d)         e       Teacher provides students with feedback that is accurate, specific, constructive and timely (FFT3d)         students are engaged in reality of kellace projects and problem solving experiences         e       A variety of active engagement strategies are employed         i       Teacher integrates academic content with career/technical content (circle all that apply)         i. Teacher integrates academic content with career/technical that apply)	a. Most of teacher's questions	are of high quality and adequate	-	· .		1
b       The fession has a clearly defined structure of activities and is.         i       well spaced instruction is from thell to bell (FFT3c)         c       Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)         d       instructional goals on an off ully appropriate to the students or to the instructional goals on an off ully appropriate to the students or to the instructional goals on a lesson (FFT3c)         c       Teacher provides students with feedback that is accurate, specific, constructive and timely (FFT3d)         c       A variety of active engagement strategies are employed         d       Teacher uses frequent formative assessment to check for understanding         i       Teacher uses frequent formative assessment to check for understanding         i       Teacher uses frequent formative assessment to check for understanding         i       Teacher integrates academic content with career/technical content (circle all that apply)         i       Teacher integrates academic content with career/technical content (circle all that apply)         i       Teacher integrates academic content with career/technical content (circle all that apply)	time is available for student:	s to respond (FFT3b)	L_I .			ľ
c.       Representation of content is appropriate and links well with students' knowledge and experience (FFT3c)       Image: Content is appropriate and links well with students' knowledge and experience (FFT3c)         id.       Instructional groups are productive and fully appropriate for the students or to the instructional goals of a lesson (FFT3c)       Image: Content is appropriate and image: Content with feedback that is accurate, specific, constructive and timely (FFT3d)       Image: Content is appropriate and image: Content with feedback that is accurate, specific, constructive and timely (FFT3d)       Image: Content is appropriate and image: Content with career/technical content (circle all that apply)         e.       A variety of active engagement strategies are employed       Image: Content with career/technical content with career/technical content (circle all that apply)       Image: Content with career/technical content with career/technical content (circle all that apply)         i.       Teacher integrates academic content with career/technical content (circle all that apply)       Image: Content content is applied as a content with career/technical content (circle all that apply)       Image: Content content is applied as a content content with career/technical content content content content content content is an engage dim intellectually challenging tasks (circle all that apply)       Image: Content content is applied in intellectually challenging tasks (circle all that apply)	<ul> <li>b The lesson has a clearly defined well-paced instruction is from the second s</li></ul>	ned structure of activities and is the model of the structure of activities and is the structure of activities and is the structure of a stru				
students' knowledge and experience (FFT3c)       Image: Comparison of the instructional goals of a lesson (FFT3c)         dd = Instructional groups are productive, and fully appropriate to:       Image: Comparison of the instructional goals of a lesson (FFT3c)         e. Teacher provides students with feedback that is accurate,       Image: Comparison of the instructional goals of a lesson (FFT3c)         e. Teacher provides students with feedback that is accurate,       Image: Comparison of the instructional goals of a lesson (FFT3c)         e. Teacher provides students with feedback that is accurate,       Image: Comparison of the instructional goals of a lesson (FFT3c)         e. Teacher provides students with feedback that is accurate,       Image: Comparison of the instructional goals of a lesson (FFT3d)         f. Students are engaged in real workplace projects and propheric       Image: Comparison of the instruction of t	c. Representation of content is	appropriate and links well with	and a start of the start of the			
del Instructional groups are productive and fully appropriate to the students on to the instructional goals of a lesson (FFT3c)       Image: Constructive and timely (FT3d)         e. Teacher provides students with feedback that is accurate, specific, constructive and timely (FT3d)       Image: Constructive and timely (FT3d)         e. A variety of active engagement strategies are employed       Image: Constructive assessment to check for understanding       Image: Constructive assessment to check for the students are engaged in intellectually challenging tasks (circle allac)         i. Teacher integrates academic content with career/technical content (circle all that apply)       Image: Circle allac)         i. Solve problemy       Image: Circle allac)         i. Solve problemy       Image: Circle allac)         i. Teacher integrates academic content with career/technical content (circle all that apply)       Image: Circle allac)         i. Solve problemy       Mathematics	students' knowledge and exp	perience (FFT3c)			e	
<ul> <li>the students or to the instructional gals of allesson [FF]3c]</li> <li>e. Teacher provides students with feedback that is accurate, specific, constructive and timely [FFT3d]</li> <li>f. Students are engaged in real-workplace projects and problem</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. Reading</li> <li>g. Reading</li> <li>g. Writing</li> <li>g. Mathematics</li> <li>g. Solve problem</li> <li>g. Mathematics</li> <li>g. Solve problem</li> <li>g. Mathematics</li> <li>g. Solve problem</li> </ul>	de Instructional groups are proc	uctive and fully appropriate to			Sec. B. B. S.	0
<ul> <li>e. Teacher provides students with feedback that is accurate, specific, constructive and timely [FFT3d]</li> <li>i. Students are engaged in real workplace projects and problem</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li> <li>g. A variety of active engagement strategies are employed</li></ul>	the students or to the instruc	Monal goals of a lesson [FFI3c]		V.		
specific, constructive and timely [FFT3d]       Image: Constructive and timely [FFT3d]         Students are engaged in real workplace projects and problem       Image: Constructive and timely [FFT3d]         solving experiences       Image: Constructive and timely [FFT3d]         e       A variety of active engagement strategies are employed         a.h.       Feacher uses frequent formative assessment to check for the understanding         i.       Teacher integrates academic content with career/technical content (circle all that apply)         f.       Solvenproblem         f.       Solvenproblem         i.       Teacher integrates academic content with career/technical content (circle all that apply)         f.       Solvenproblem         f.       Solvenproblem         Make decision       Analyze	e. Teacher provides students w	ith feedback that is accurate,				
solving experiences g. A variety of active engagement strategies are employed	specific, constructive and tim	ely [FFT3d]	L. I	Z		
g. A variety of active engagement strategies are employed       Image: Content variety of active assessment to check for         a.h. Heacher uses frequent formative assessment to check for       Image: Content variety of active assessment to check for         i. Teacher integrates academic content with career/technical content (circle all that apply)       Image: Content variety of active matrices         i. Teacher integrates academic content with career/technical content (circle all that apply)       Image: Content variety of active matrices         i. Students are engaged in intellectually challenging tasks (circle all content variety of active matrices)       Image: Content variety of active matrices         i. Solve problement Make decision       Image: Content variety of active matrices		workplace projects and problem-				
i. Teacher integrates academic content with career/technical content (circle all that apply) i. Teacher integrates academic content with career/technical content (circle all that apply) i. Teacher integrates academic content with career/technical content (circle all that apply) i. Teacher integrates academic content with career/technical content (circle all that apply) i. Teacher integrates academic content with career/technical content (circle all that apply) i. Teacher integrates academic content with career/technical content (circle all that apply) i. Solve problems Make decisions (analyze)	g. A variety of active engageme					
Enderstanding     Teacher integrates academic content with career/technical     content (circle all that apply)     Students are engaged in intellectually challenging tasks (circle all 10)     Plan Create Dsynthesize Analyze     Solve problem Make decision Landy	a h. leacher uses frequent forma		Contraction of the second seco	Z		
Teacher integrates academic content with career/technical     Content (circle all that apply)     Students are engaged in intellectually challenging tasks (circle all-12     Plan Greate Synthesizer Analyze     Solve problems Make decisions Landy	Understanding	Letter and the second second				1
Content (circle all that apply) J. Students are engaged in intellectually challenging tasks (circle all 10) that apply) Solve problems Make decisions II Analyze Solve problems Make decisions II Analyze	i. Teacher integrates academic	content with career/technical				
that apply) Apply Solve problem - Make decision LAndy	content (circle all that apply)		Read	ingiw	ritine Math	rematics
Solve problems Makedecisions Anniv	- / Olugents are engaged in intell	ectually challenging tasks (circle al		State		
Solve problems Make decisions Anniv			Plan	Freate	PSynthesize	Analyze
	A CONTRACT OF A		Solveprol	blems N	lake decision	Apply

Techer #2

### Teachers' Sense of Efficacy Scale<sup>1</sup> (long form) Teacher Beliefs

	_1	eacher Delleis	How much can you do?									
	Directions: This questionnaire is desig kinds of things that create difficulties f your opinion about each of the statem	ned to help us gain a better understanding of the priteachers in their school activities, Please indicate ents below. Your answers are confidential.	Va thing	<b>a</b>	/ery Little		ome	off vence	urie ∧ Bit		j.	Bal
	<ol> <li>How much can you do to get through the set of the set</li></ol>	igh to the most difficult students?	(1	) (2	) (3)	(4	) (5	; ; (	<u> </u>	7) (	⊄ 8) (*	9) 9)
1	<ol><li>How much can you do to help you</li></ol>	r students think critically?	(1	) (2)	) (3)	(4	) (5	. (6	5 (7	7) (í		
3	<ol><li>How much can you do to control d</li></ol>	lisruptive behavior in the classroom?	(1	) (2)	(3)	(4	) (5	) (6	a 17		-/ •	
	<ol> <li>How much can you do to motivate work?</li> </ol>	students who show low interest in school	(1	) (2)	(3)	(4)	) (5)	) (6	)	) (t	3) (8	9)
5	5. To what extent can you make your	r expectations clear about student behavior?	(1	) (2)	(3)	(4)	) (5)	) (6)	) (7	') (E	3) 🛃	
6	5. How much can you do to get stud	ents to believe they can do well in school work?	? (1	) (2)	(3)	(4)	(5)	) (6)	) (7	) (	<b>(</b> 9	
7	<ol> <li>How well can you respond to diffic</li> </ol>	ult questions from your students ?	(1	) (2)	(3)	(4)	(5)	(6)	(7	) 🙋	, (S	
8	. How well can you establish routine	s to keep activities running smoothly?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	) 📾	• (9	
9	. How much can you do to help your	students value learning?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	) (1	) (9	
1	0. How much can you gauge student	comprehension of what you have taught?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	) (8	) 🖪	
1	1. To what extent can you craft good	questions for your students?	(1)	(2)	(3)	(4)	(6)	(6)	(7)	(8)		
1:	2. How much can you do to foster stu	dent creativity?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	•	) (9)	
13	3. How much can you do to get childre	an to follow classroom rules?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
14	4. How much can you do to improve th	ne understanding of a student who is failing?	(1)	(2)	(3)	(4)	(5)	. (6)	(7)	(8)		
15	5. How much can you do to calm a stu	ident who is disruptive or noisy?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	6	(9)	
16	3. How well can you establish a classr students?	oom management system with each group of	(٦)	(2)	(3)	(4)	(5)	(6)	(	(8)	(9)	
17	'. How much can you do to adjust you students?	r lessons to the proper level for individual	(1)	(2)	(3)	(4)	(5)	(6)	Ô	(8)	(9)	
18	How much can you use a variety of	assessment strategies?	(1)	(2)	(3)	(4)	ک	(6)	(7)		(0)	
1 <b>9</b> .	. How well can you keep a few proble	m students form ruining an entire lesson?	(1)	(2)	(3)	(4)	(5)	(0)	(7).	(0)	(9)	
20.	To what extent can you provide an a students are confused?	llemative explanation or example when	.(1)	(2)	(3)	(4)	(5) (5)	(6)	(7)	(8) (8)	9	
21.	How well can you respond to defight	Sludents?	(1)	(2)	(3 <u>)</u> (	(4)	(5)	<b>(6</b> )	(7)	(8)	R	*   
22.	How much can you assist families in	helping their children do well in school?	(1)	(2)	(3) (	4)	(5)	(6)	(7)	(8)		
23. 2	How well can you implement alternat	ive strategies in your classroom?	(1)	(2) 1	3) (	4) (	(5)	(6)	<b>.</b>	(8)	(9)	
24	How well can you provide appropriate	e challenges for very capable students?	(1)	 (2) (	3) (-	4) (	(5) (	(6) (	<b>-</b> (7) -	(8)	631)	

NCITEC CTE Teacher Obs	servation
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Classroom Checklist

Teacher #1 Date: /0/11/13

Observer's Name:

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Instructions: Place a ( $\checkmark$ ) in the appropriate box.

I. Plai	nning and Preparation	Unsatisfactory	Basic	Proficient	Distinguished
i a.	Teacher displays understanding of students skills, knowledg and needs, including special learning needs [FFT16]	e) 📄		_ É	
b.	Teacher displays knowledge of interests of students [FFT1b]				Ø
C.	Instructional goals (e.g. standard and objective) are dearly				
d.	Instructional goals include: (circle all that apply)	Technical content	Academic o	content   21 <sup>°</sup>	<sup>t</sup> Century skills
II. Cla	ssroom Environment				· · · · ·
, <b>.</b>	Teacher-student interactions are friendly and demonstrate-				z z
b.	The lesson, interactions and classroom environment conveys clear expectations for positive student behavior [FFT2b]				Ø
G	<ul> <li>Inansitions occur smoothly, with little loss of instructional time (teacher starts class ready to go and has a clear closing and ot clears) (5552).</li> </ul>	at 📰			Z
d.	Teacher uses appropriate interventions to respond to unwanted behavior and respects the student's dignity, or student behavior is generally appropriate [FFT2d]			Ø	
e.	<ul> <li>The classroom and laboratory space are orderly and support dearning (FFI2e)</li> </ul>				Į į
f.	The physical space includes motivational displays (circle all that apply):	Student work	Career-Co	ourse content	connections
III. In	struction		Recognitic		achievenients
a.	Most of teacher's questions are of high quality and adequate time is available for students to respond [FFT3b]			Þ	
Б.	The lesson has a clearly defined structure of activities and is well-paced. Instruction is from Sell-to-bell (FFFSC).				
С.	Representation of content is appropriate and links well with students' knowledge and experience [FFT3c]				Ø
đ.	instructional groups are productive and fully appropriate to the students or to the instructional goals of a lesson [FF13c]			<u>ø</u>	. 0.
e.	Teacher provides students with feedback that is accurate, specific, constructive and timely [FFT3d]			ø	
f.	Students are engaged in real-workplace projects and problem		- D		, pí
g.	A variety of active engagement strategies are employed				Ø
à.	Freacher uses frequent formative assessment to dreck for			Ø	
	Teacher integrates academic content with career/technical		leading/1/	Writing)	athematics
	content (circle all that apply) Students are engaged in intellectually challenging tasks: (circ	( leall	Z Planet Crea	teal Synthes	izer]: Ânalyze
	uhat apply)	Solve	problems	Make decis	ions ( Apply

NCITEC CTE Teacher O	bservation			1	PI leaster	- #2
		Data	11/	18/13		
leacher's Name:	· · ·	Caure.	Tra	· · · ·		
Observer's Name:	·	Course	<u>- 1147</u>	istics		
Instructions: Place a $(\checkmark)$ in the appropriate box.						ר
I. Planning and Preparation	Unsatist	actory	Basic	Proficient D	listinguisnea	Millione
and needs, including special learning needs [PF11b]						
b. Teacher displays knowledge of interests of students [FFT1b]					P	
<ul> <li>Instructional goals (e.g. standard and objective) are dearly visible cod with the independent of the standard and objective).</li> </ul>			Ô			1141 1251 1247 <i>201</i> 29
d. Instructional goals include: (circle all that apply)	Technical con	tent   Ac	ademic c	ontent   21 <sup>st</sup> Co	entury skills	_
II. Classroom Environment						5
a. Teacher-student interactions are fillendly and demonstrate				Ø		10 HH TOTH TO HIS
b. The lesson, interactions and classroom environment convey	′ <sup>s</sup>			R		ŧ.
clear expectations for positive student behavior [FFT2b]						
time (teacher starts class ready to go and has a clear closing	at E			P		
d. Teacher uses appropriate interventions to respond to						24
unwanted behavior and respects the student's dignity, or				_ كر		
G The classroom and laboratory space are orderly and support	t E					949142010157mL
f. The physical space includes motivational displays	Ctudopt		Stroot Co		annections	
(circle all that apply):	CTSO inform			n of student ac		
III Instruction						-
a. Most of teacher's questions are of high quality and adequat	e ,	e4. 1.			R	
time is available for students to respond [FFT3b]						Price la
<ul> <li>The lesson has a clearly defined structure of activities and is well-pared. Instruction is from bell-to-bell (FFIBC)</li> </ul>						12) IL ATTANCA IN
c. Representation of content is appropriate and links well with					R	
students' knowledge and experience [FFT3c]						8.447
<ul> <li>d. Instructional groups are productive and fully appropriate to the students or to the instructional goals of a lesson [FFI3c]</li> </ul>				- 9-		
e. Teacher provides students with feedback that is accurate,					Ø	
specific, constructive and timely [FFT3d]	m=					Birther 1
SOLVINE CXDEFTENDES						
g. A variety of active engagement strategies are employed		Na mandra da Marcial				
<ul> <li>Treacher uses frequent formative assessment to check for understanding</li> </ul>						
i. Teacher integrates academic content with career/technical		Re	ading	Writing ) Mat	hematics	
j. Studentstarelengaged in intellectually challenging tasks: (cir	cle all	₩	andikCrea	te Synthesize	Analyze	
inat apply)		Solven	roblems	Makerdecisio	ns Apply	
				$\langle $	$\sim$	•