Appendix B

Quality of Instruction

Classroom Assessment Scoring System (CLASS)

What is CLASS?

The Classroom Assessment Scoring System (CLASS) is a classroom observation tool developed at the University of Virginia's Curry School of Education. It aims to provide a common lens and language focused on classroom interactions that encourage student learning.

CLASS observations break down the complex classroom environment to help educators focus on boosting the effectiveness of their interactions with learners of all ages. Observations rely on categorizing interactions within the CLASS framework.

The CLASS tool organizes teacher-student interactions into three broad domains: Emotional Support, Classroom Organization, and Instructional Support. The upper elementary and secondary tools include an additional domain, Student Engagement. Within all domains except Student Engagement, interactions are further organized into multiple dimensions. **Table 1** lists the domains and dimensions for each level.

Emotional Support: Students' social and emotional functioning in the classroom is increasingly recognized as an indicator of school readiness, a potential target for intervention, and even as a student outcome that might be governed by a set of standards similar to those for academic achievement. Students who are more motivated and connected to others are much more likely to establish positive trajectories of development in both social and academic domains. Teachers' abilities to support social and emotional functioning in the classroom are therefore central to ratings of effective classroom practices.

Classroom Organization: The classroom organization domain assesses a broad array of classroom processes related to the organization and management of students' behavior, time, and attention in the classroom. Classrooms function best and provide the most opportunities for learning when students are well-behaved, consistently have something to do, and are interested and engaged in learning tasks.

Instructional Support: The theoretical foundation for the instructional support domain is based on research on children's cognitive and language development. Thus the emphasis is on students' construction of usable knowledge, rather than rote memorization, and metacognition—or the awareness and understanding of one's thinking process. As a result, the instructional support domain does not make judgments about curriculum content; rather, it assesses the effectiveness of teachers' interactions with students that support cognitive and language development.

Student Engagement: Unlike other domains, student engagement focuses strictly on student functioning, and measures the overall engagement level of students in the classroom.

Table 1: CLASS Domains and Dimensions

Domain	Dimensions			
	Pre-K	**Lower Elementary**	**Upper Elementary**	**Secondary**
Emotional Support	Positive Climate Negative Climate Teacher Sensitivity Regard for Student Perspectives	Positive Climate Negative Climate Teacher Sensitivity Regard for Student Perspectives	Positive Climate Teacher Sensitivity Regard for Student Perspectives	Positive Climate Teacher Sensitivity Regard for Adolescent Perspectives
Classroom Organization	Behavior Management Productivity Instructional Learning Formats	Behavior Management Productivity Instructional Learning Formats	Behavior Management Productivity Negative Climate	Behavior Management Productivity Negative Climate
Instructional Support	Concept Development Quality of Feedback Language Modeling	Concept Development Quality of Feedback Language Modeling	Content Understanding Analysis and Inquiry Instructional Learning Formats Quality of Feedback Instructional Dialogue	Content Understanding Analysis and Inquiry Instructional Learning Formats Quality of Feedback Instructional Dialogue
Student Engagement	n/a	n/a	Student Engagement	Student Engagement

Based on research from the University of Virginia's Curry School of Education and studied in thousands of classrooms nationwide, the CLASS

- focuses on effective teaching
- helps teachers recognize and understand the power of their interactions with students
- aligns with professional development tools
- works across age levels and subjects

CLASS-based professional development tools increase teacher effectiveness, and students in classrooms where teachers are observed to demonstrate and earn higher CLASS scores achieve at higher levels than their peers in classrooms with lower CLASS scores.[1]

[1] Teachstone Inc. http://www.teachstone.org/about-the-class/

CLASS and Program Evaluation

APS conducts CLASS observations for all program evaluation reports, starting in the 2010-11 school year. In the fall of 2010, the Office of Planning and Evaluation recruited retired teachers and administrators to become certified CLASS observers. Certification is managed by the University of Virginia. Trainees undergo in-depth training to help them use the tool effectively in the field. An assessment is used to ensure that the observers have demonstrated reliability with the CLASS tool.

Each observation lasts approximately 30 minutes and observers are instructed to view either the beginning or end of a class. Ten additional minutes are provided for coding of the observation. Self-contained classrooms that serve ESOL/HILT students or students with a disability, as well as mainstream classrooms with ESOL/HILT students or students with a disability, are included.

CLASS Scores

CLASS dimensions are scored on a 7-point scale consisting of Low (1, 2), Mid (3, 4, 5), and High (6, 7) ranges. A score in the low range indicates an absence or lack of the behaviors associated with a given dimension, while a score in the high range indicates a high presence of such behaviors. Scores in the high range are desirable for all dimensions except for Negative Climate. With this dimension, the goal is a low score, or an absence of negativity.

Research Foundations of CLASS

The CLASS framework is derived from developmental theory and research suggesting that interactions between students and adults are the primary mechanism of child development and learning.

Elementary CLASS

Research provides evidence about the types of teacher-student interactions that promote positive social and academic development. The Classroom Assessment Scoring System™ (CLASS) provides a reliable, valid assessment of these interactions[2]

Selected studies demonstrate:

- Higher levels of instructional support are related to preschoolers' gains in pre-reading and math skills.[3]
- High levels of emotional support contribute to preschoolers' social competence in the kindergarten year.[4]
- High levels of emotional support are associated with growth in reading and math achievement from kindergarten through fifth grade.[5]
- High levels of classroom organization are associated with gains in first graders' literacy.[6]
- Kindergarten children are more engaged and exhibit greater self-control in classrooms offering more effective teacher-child interactions.[7]

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[2] Karen LaParo, Robert Pianta, and Meghan Stuhlman, "Classroom Assessment Scoring System (CLASS): Findings from the Pre-K Year," Elementary School Journal, 104:5, pages 409-426.
[3] Mashburn, Pianta, Hamre, Downer et al., Child Development,79, pages 732-749.
[4] Timothy Curby, Jennifer Locasale-Crouch, Timothy Konold, Robert Pianta, Carollee Howes, Margaret Burchinal et al., "The Relations of Observed Pre-K Classrooms Quality Profiles to Children's Academic Achievement and Social Competence," Early Education and Development, 19, pages 643-666.
[5] Robert Pianta, Jay Belsky, Nathan Vandergrift, Renee Houts, Fred Morrison, and NICHD-ECCRN, "Classroom Effects on Children's Achievement Trajectories in Elementary School," American Education Research Journal, 49, pages 365-397.
[6] Claire Cameron Ponitz, Sara Rimm-Kaufman, Laura Brock, and Lori Nathanson, "Contributions of gender, early school adjustment, and classroom organizational climate to first grade outcomes," Elementary School Journal, 110, 142-162.

- First-grade children at risk for school failure perform on par with peers, both socially and academically, when exposed to classrooms with effective teacher-student interactions.[8]

Moreover, studies conducted in over 6,000 classrooms provide evidence that students in PK–5 classrooms with higher CLASS ratings realize greater gains in achievement and social skill development.[9]

Secondary CLASS

Research using the more recently developed secondary CLASS tool has shown that teachers' skills in establishing a positive emotional climate, their sensitivity to student needs, and their structuring of their classroom and lessons in ways that recognize adolescents' needs for a sense of autonomy and control, for an active role in their learning, and for opportunities for peer interaction were all associated with higher relative student gains in achievement.[10]

Alignment with APS Initiatives

Differentiation

The four domains measured by the CLASS are essential in effectively differentiated classrooms. In addition, dimensions such as teacher sensitivity, regard for student/adolescent perspectives, and instructional learning formats specifically address behaviors necessary for effective differentiation.

Teacher Evaluation (Danielson)

The CLASS tool is heavily aligned with Charlotte Danielson's Framework for Teaching[11], which sets forth standards for teaching behaviors in the areas of planning, instruction, classroom environment, and professional responsibility. Danielson's Levels of Performance rubrics are the foundation for all T-Scale staff evaluation in APS.

Cultural Competence

There is strong alignment between Gay's Exemplars of Culturally Responsive Behaviors[12] and classroom behaviors identified in the CLASS tool. The APS Council for Cultural Competence was established in 2003 to develop the framework for permanent, systemwide cultural competence activities including ongoing cultural competence training for all staff. Cultural competence is a set of attitudes, skills, behaviors, and policies that enable organizations and staff to work effectively in cross-cultural situations.

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[7] Sara Rimm-Kaufman, Timothy Curby, Kevin Grimm, Lori Nathanson and Laura Brock, "The Contribution of Children's Self-Regulation and Classroom Quality to Children's Adaptive Behavior in Kindergarten," Developmental Psychology, in-press. See also NICHD ECCRN, "A Day in Third Grade: A Large- Scale Study of Classroom Quality and Teacher and Student Behavior," Elementary School Journal, 105, pages 305-323.

[8] Bridget Hamre and Robert Pianta, "Can Instructional and Emotional Support in First Grade Classrooms Make a Difference for Children At Risk of School Failure?" Child Development, 76, pages 949-967.

[9] Website http://curry.virginia.edu/uploads/resourceLibrary/CLASS-MTP_PK-12_brief.pdf Center for Advanced Study of Teaching and Learning Charlottesville, Virginia, **Measuring and Improving Teacher-Student Interactions in PK-12 Settings to Enhance Students' Learning**

[10] Joseph P. Allen, Anne Gregory, Amori Mikami, Janetta Lun, Bridget Hamre, and Robert C. Pianta, "Observations of Effective Teaching in Secondary School Classrooms: Predicting Student Achievement with the CLASS-S." Submitted.

[11] Charlotte Danielson (2007), *Enhancing Professional Practice: A Framework for Teaching*, Alexandria, VA: ASCD.

[12] Geneva Gay (2000). *Culturally Responsive Teaching: Theory, Research, & Practice.* New York: Teachers College Press.

SIOP

Many of the dimensions of the CLASS are aligned with components of the Sheltered instruction Observation Protocol (SIOP)[13], an approach to teaching that promotes content-area learning and language development for English language learners. SIOP encourages teachers to adapt grade-level content lessons to the students' levels of English proficiency, while focusing on English language development to help students increase their proficiency in academic English.

[13] Website http://siop.pearson.com/about-siop

Appendix B2

Alignment of the Classroom Assessment Scoring System (CLASS) With APS Best Instructional Practices

Domain/ Dimension	Grades Observed	Description of CLASS Dimensions	Alignment with			
			Differentiation[1]	Responsive Education[2]	Danielson[3]	SIOP[4]
Emotional Support						
Positive Climate	Pre-K - 12	Reflects the emotional connection and relationships among teachers and students, and the warmth, respect, and enjoyment communicated by verbal and non-verbal interactions.		X	X	
Teacher Sensitivity	Pre-K - 12	Encompasses the teacher's awareness and responsiveness to the academic, social-emotional, and developmental needs of individual students and the entire class. At the younger levels, it also includes the teacher's ability to consistently provide comfort, reassurance, and encouragement.	X	X	X	X
Regard for *Student/Adolescent* Perspective	Pre-K – 3	*Student:* At the younger levels, it captures the degree to which the teacher's interactions with students and classroom activities place an emphasis on students' interests, motivations, and points of view and encourage student responsibility and autonomy.	X	X	X	X
	4-12	*Adolescent:* At the older levels, it focuses on the extent to which the teacher is able to meet and capitalize on the social and developmental needs and goals of (pre)adolescents by providing opportunities for student autonomy and leadership. Also considered are the extent to which student ideas and opinions are valued and content is made useful and relevant to (pre)adolescents.	X	X	X	X
Classroom Organization						
Behavior Management	Pre-K - 12	Encompasses the teacher's use of clear behavioral expectations and effective methods to prevent and redirect misbehavior.		X	X	
Productivity	Pre-K - 12	Considers how well the teacher manages time and routines so that instructional time is maximized.			X	
Negative Climate[5]	Pre-K - 12	Reflects the overall level of expressed negativity among teachers and students in the classroom; the frequency, quality, and intensity of teacher and student negativity are important to observe.		X	X	
Instructional Support						
Concept Development	Pre-K – 3	Measures the teacher's use of instructional discussions and activities to promote students' higher-order thinking skills and cognition and the teacher's focus on understanding rather than on rote instruction.	X		x	X

[1] Differentiation or differentiated instruction is an approach that recognizes that all students must master a common body of knowledge and skills, but each student learns a different way and needs an approach most appropriate to his or her learning needs. Differentiation relates to content (what students learn), process (how students learn), and product (how students demonstrate what they've learned). Students differ in readiness (prior mastery of knowledge, understandings, and skills), interest (curiosity and passion to know, understand, or do more), and how they prefer to learn (Tomlinson, 1999).

[2] Responsive education or culturally responsive teaching is a pedagogy that recognizes the importance of including students' cultural references in all aspects of learning (Ladson-Billings, 1994).

Alignment of the Classroom Assessment Scoring System (CLASS) With APS Best Instructional Practices

Domain/ Dimension	Grades Observed	Description of CLASS Dimensions	Alignment with			
			Differentiation[1]	Responsive Education[2]	Danielson[3]	SIOP[4]
Content Understanding	4-12	Refers to both the depth of the lesson content and the approaches used to help students comprehend the framework, key ideas, and procedures in an academic discipline. At a high level, this refers to interactions among the teacher and students that lead to an integrated understanding of facts, skills, concepts, and principles.		X	X	X
Analysis and Inquiry	4-12	Assesses the degree to which the teacher facilitates students' use of higher-level thinking skills, such as analysis, problem solving, reasoning, and creation through the application of knowledge and skills. Opportunities for demonstrating metacognition, i.e. thinking about thinking, are also included.	X	X		X
Instructional Learning Formats[6]	Pre-K - 12	Focuses on the ways in which the teacher maximizes students' interest and engagement in learning. This includes the teacher's use of interesting and engaging lessons and materials, active facilitation, and clarity of learning objectives.	X	X	X	X
Quality of Feedback	Pre-K - 12	Assesses the degree to which feedback expands and extends learning and understanding and encourages student participation. (At the secondary level, significant feedback may be provided by peers)		X	X	X
Language Modeling	Pre-K-3	Captures the quality and amount of the teacher's use of language-stimulation and language-facilitation techniques.			X	X
Instructional Dialogue	4-5	Captures the purposeful use of dialogue- structured, cumulative questioning and discussion which guide and prompt students- to facilitate students' understanding of content and language development. The extent to which these dialogues are distributed across all students in the class and across the class period is important to this rating.			X	X
Student Engagement	4-12	Intended to capture the degree to which all students in the class are focused and participating in the learning activity presented or facilitated by the teacher. The difference between passive engagement and active engagement is of note in this rating.		X	X	X

[3] Danielson's Domains of Teaching Responsibility frame the APS teacher evaluation process and are based on Charlotte Danielson's Enhancing Professional Practice. The domains are the areas in which T-Scale employees are evaluated and are the foundation for Best Instructional Practices. For classroom based teachers they include: Planning and Preparation, Classroom Environment, Instruction and Professional Responsibilities. For non-classroom-based teachers the domains are: Planning and Preparation, Environment, Delivery of Service, and Professional Responsibilities.

[4] Sheltered instruction Observation Protocol (SIOP) is an approach to teaching that promotes content-area learning and language development for English language learners. Teachers adapt grade-level content lessons to the students' levels of English proficiency, while focusing on English language development to help students increase their proficiency in academic English.

[5] This dimension falls under the Emotional Support domain at the pre-K and lower elementary levels.

[6] This dimension falls under the Classroom Organization domain at the pre-K and lower elementary levels.

Classroom Assessment Scoring System *Domain and Dimension Scores*

CLASS is an observation tool developed at the University of Virginia's Curry School of Education to help analyze the interactions between teachers and their students in order to boost the effectiveness of teaching and learning.

The secondary CLASS tool organizes these teacher-student interactions into four broad domains: Emotional Support, Classroom Organization, Instructional Support and Student Engagement.

CLASS observations were conducted in the fall of 2015 at both the middle school and high school level, where CTE courses were offered. Observers conducted two 30 minutes cycle observations for each teacher.

Table 1: Sample Size of CTE CLASS Observations, Fall 2015

Response Group	Number of Teachers	Number of Observations	Percent Observed	Margin of Error (95% Confidence Level)
Middle School	15	13	87%	10.3
High School	41	40	98%	2.5

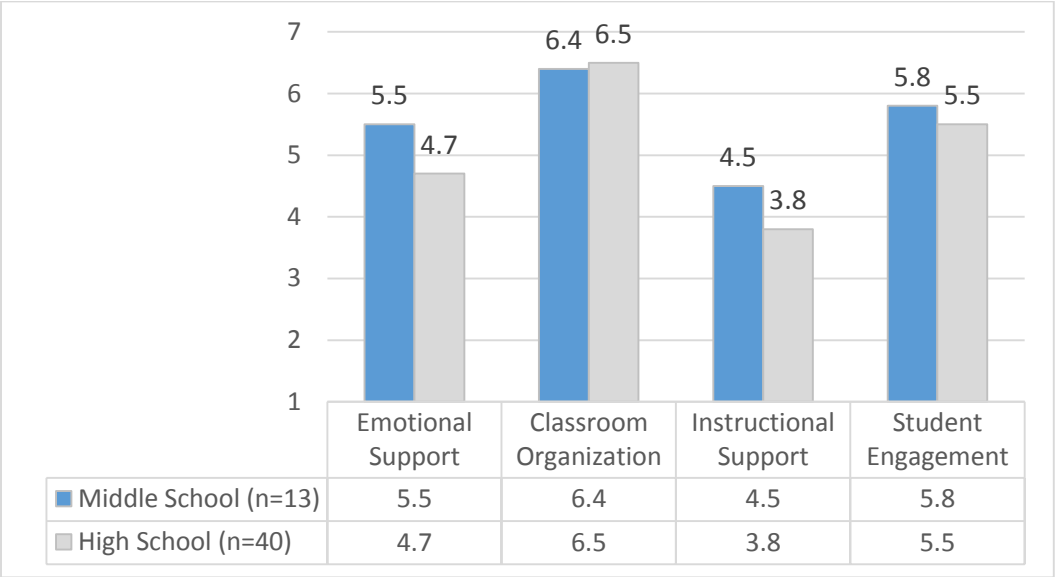
Table 2: Average Domain and Dimension Scores for Middle and High School CTE Course

Average Domain and Dimension Scores	Middle School			High School		
	N	Mean	Std. Deviation	N	Mean	Std. Deviation
Emotional Support	**13**	**5.5**	**0.9**	**40**	**4.7**	**1.0**
Positive Climate	13	5.7	1.1	40	5.1	1.1
Teacher Sensitivity	13	5.8	1.0	40	5.1	1.1
Regard for Adolescent Perspectives	13	4.9	0.9	40	3.9	1.0
Classroom Organization	**13**	**6.4**	**0.7**	**40**	**6.5**	**0.5**
Behavior Management	13	6.0	1.2	40	6.4	0.7
Productivity	13	6.5	0.5	40	6.2	0.8
Negative Climate[1]	13	1.2	0.5	40	1.0	0.1
Instructional Support	**13**	**4.5**	**1.0**	**40**	**3.8**	**0.9**
Content Understanding	13	5.0	1.0	40	4.5	1.0
Analysis and Inquiry	13	3.6	1.4	40	2.7	1.1
Instructional Learning Formats	13	5.5	1.0	40	4.9	1.0
Quality of Feedback	13	4.0	1.2	40	3.4	1.1
Instructional Dialogue	13	4.3	1.3	40	3.4	1.2
Student Engagement	**13**	**5.8**	**0.9**	**40**	**5.5**	**1.0**

[1] A lower score is desirable for the Negative Climate Dimension. The Negative Climate score is reversed when calculating the Classroom Organization Domain score.

Appendix B3

Figure 1: Average CTE CLASS Scores by Domain and Level



	Emotional Support	Classroom Organization	Instructional Support	Student Engagement
Middle School (n=13)	5.5	6.4	4.5	5.8
High School (n=40)	4.7	6.5	3.8	5.5

Figure 2: Middle School CLASS Score Distribution for Emotional Support

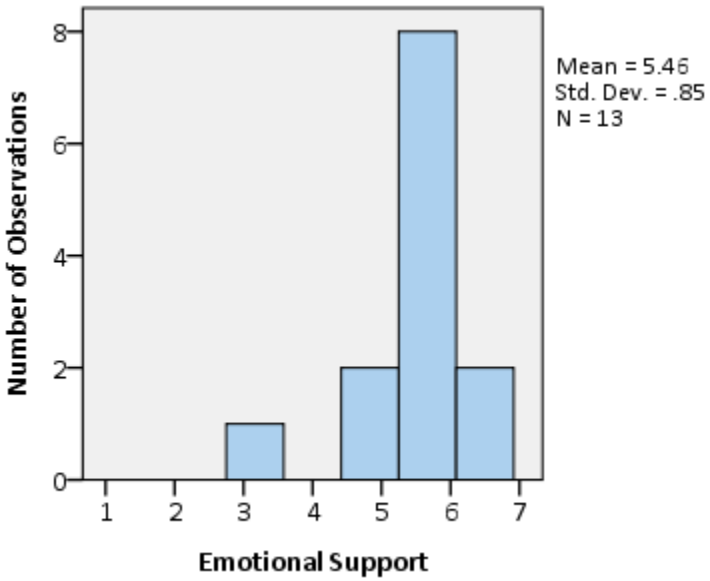


Figure 3: High School CLASS Score Distribution for Emotional Support

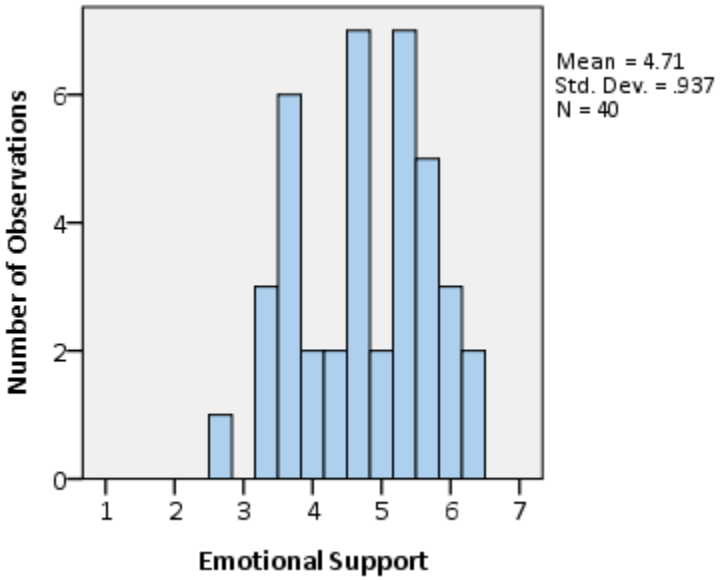


Figure 4: Middle School CLASS Score Distribution for Classroom Organization

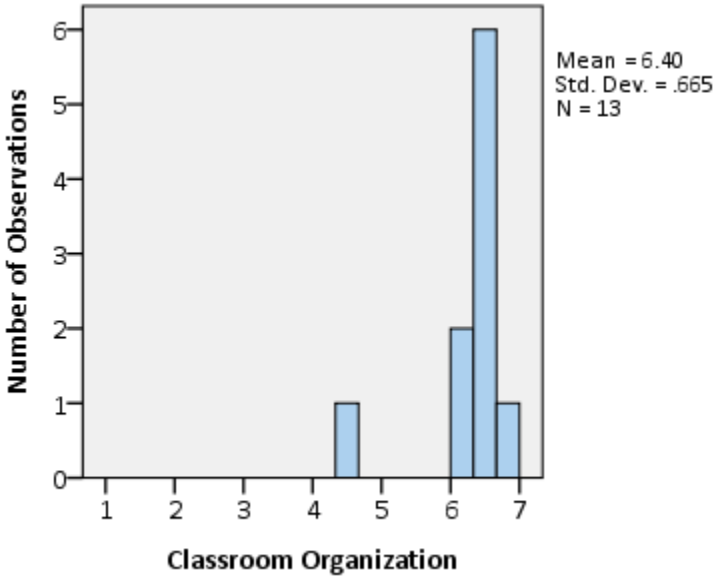


Figure 5: High School CLASS Score Distribution for Classroom Organization

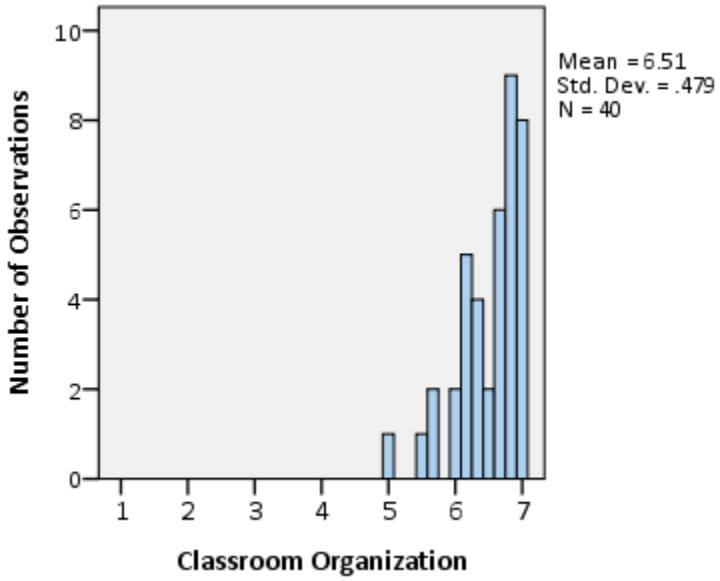


Figure 6: Middle School CLASS Score Distribution for Instructional Support

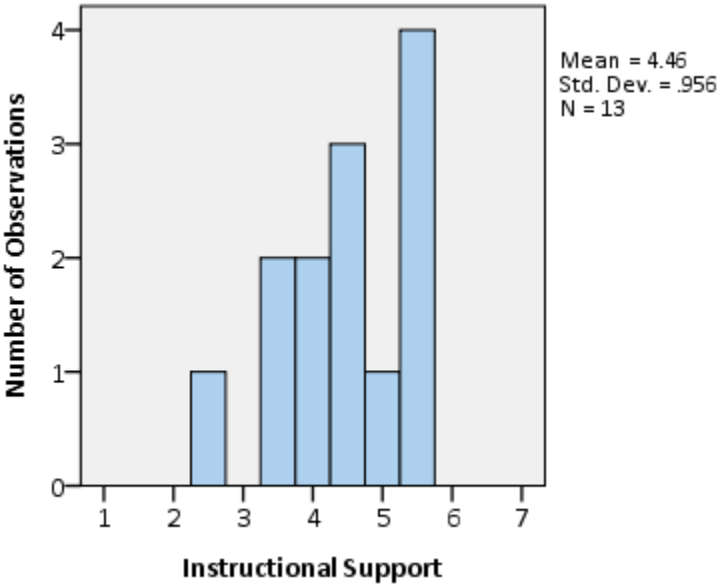


Figure 7: High School CLASS Score Distribution for Instructional Support

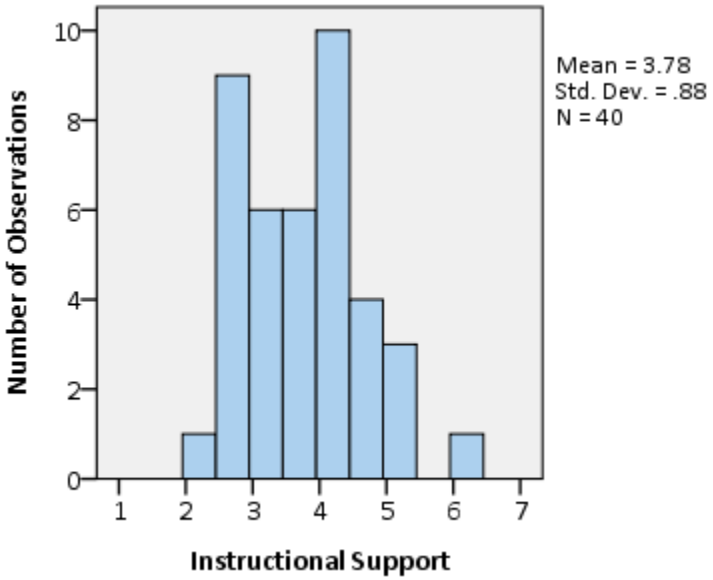


Figure 8: Middle School CLASS Score Distribution for Student Engagement

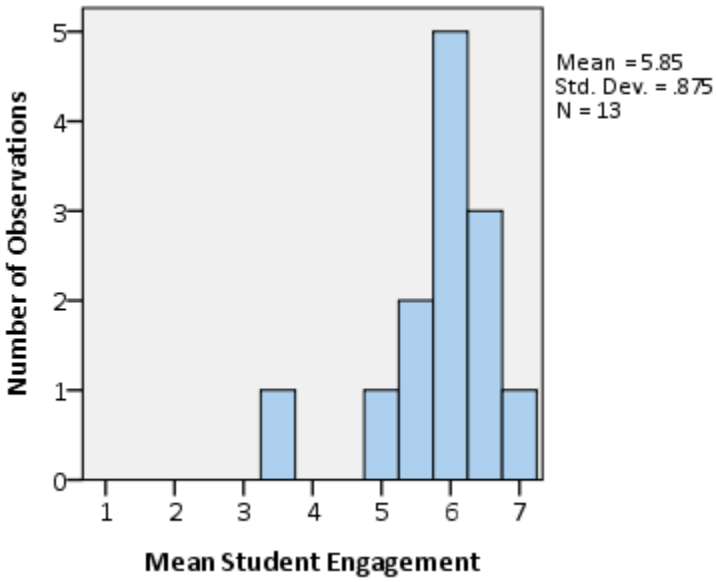
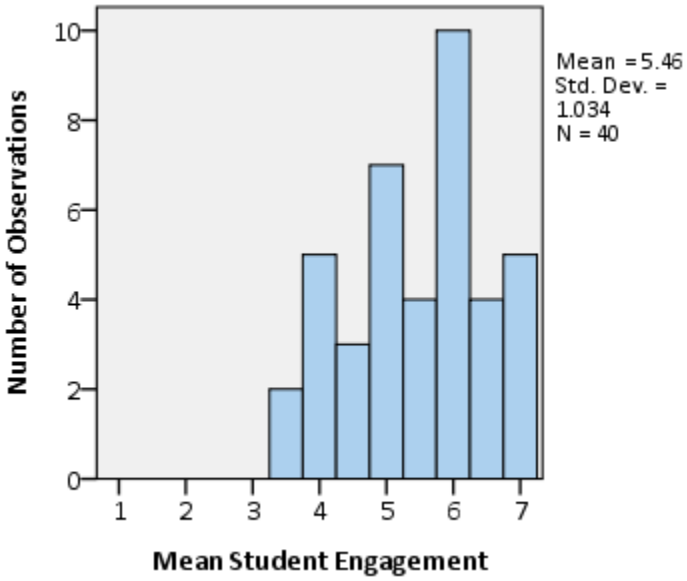


Figure 9: High School CLASS Score Distribution for Student Engagement



Appendix B4

CTAE Observation Tool

Observer ID _____ Observation ID _____ Date _____ Obs. start time _____ Obs. end time _____

Part of class observed:
- O Beginning
- O Middle
- O End

Level:
- O Middle School
- O High School

Interpretation Key

Ineffective- The teacher's instruction and practices inadequately addresses the students' learning needs.

Developing/Needs Improvement- The teacher inconsistently uses instructional strategies and practices that meet individual learning needs.

Effective- The teacher engages the students' learning by using a variety of strategies and practices to meet the individual learning needs.

Highly Effective- In addition to meeting the standard, the teacher optimizes students' opportunities to learn by engaging them in higher order thinking and/or enhanced performance skills.

	Y/N	N/A	Ineffective	Develop…	Effective	Highly Eff.	Comments
PLANNING							
1. Objectives for lesson are communicated in **writing**.							
2. Objectives for lesson are communicated **orally**.							
3. Materials for the lesson are ready for use.							
CLASSROOM ENVIRONMENT							
4. Were the following elements present in the classroom?							
Reading resources (including online)							
Student work posted							
5. Seating (Select all that apply): [ ] Rows [ ] Groups [ ] Other (please specify)_____							
6. Safety procedures are modeled by teacher. (**If no or N/A, explain in comment section**.)							
7. Safety procedures are followed by students. (**If no or N/A, explain in comment section**.)							
INSTRUCTION							
8. Which of the following **teacher** actions occurred during the lesson?							
Lecture							
Teacher-led instruction/discussion							
Teacher modeling with student practice							
Teacher works with individual students							
High-level questioning							
Informal assessment of student comprehension							
Instruction that authentically models world of work							

CTAE Observation Tool

	Y/N	N/A	Ineffective	Develop…	Effective	Highly Eff.	Comments
9. Which of the following **student** actions/activities occurred during the lesson?							
Bell ringer/warm-up activity							
Project/problem-based learning							
Lab/hands-on student work							
Cooperative group work							
Students working in pairs							
Students teaching other students							
Students making presentations							
Drill/worksheet/text seat work							
10. Lesson content and materials relate to lesson goals and objectives. (**Select N/A if no lesson goals/objectives are stated**.)							
11. Lesson includes multidisciplinary connections.							
Reading/writing							
Numeracy/math							
Science							
Other content area							

TECHNOLOGY & EQUIPMENT	
12. Please list the technology and/or equipment that the **teacher** used during the lesson: (If none, enter "none")	
13. Please list the technology and/or equipment that **students** used during the lesson: (If none, enter "none")	

	14. Use of technology and/or equipment is (check all that apply):	Comments
	Interactive	
	Enhancing instruction and fostering understanding	
	Actively engaging students in learning tasks	
	Actively engaging students in creating a product/service	
	None of the above	
	Not applicable – use of technology is not evident	

OVERALL COMMENTS

15. In two or three sentences, please describe the best part of this lesson.

16. Do you have any concerns about the lesson?

CTAE Observation Checklist

Figure 1: Percent of planning practices observed in CTAE classrooms

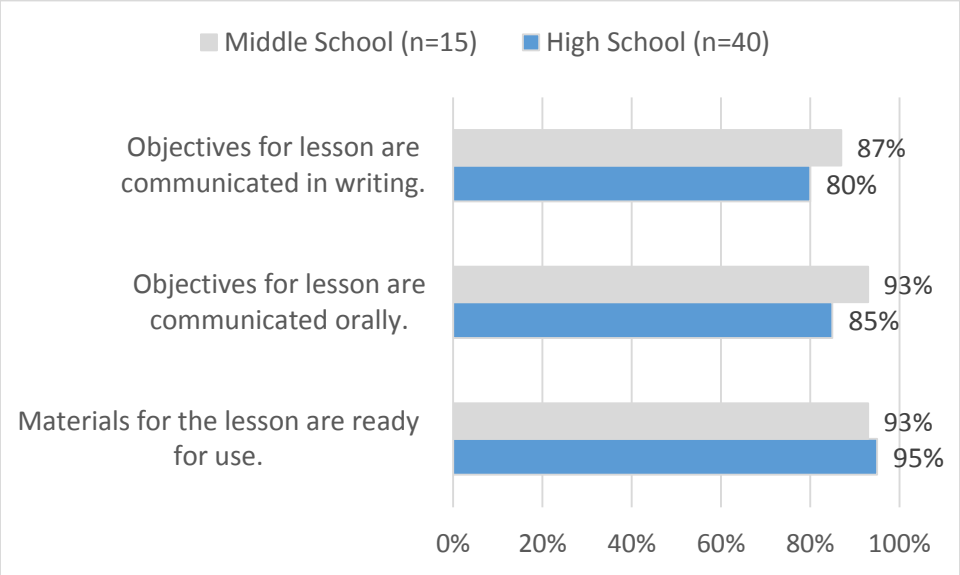


Figure 2: Level of effectiveness for identified planning practices in middle school CTAE classes

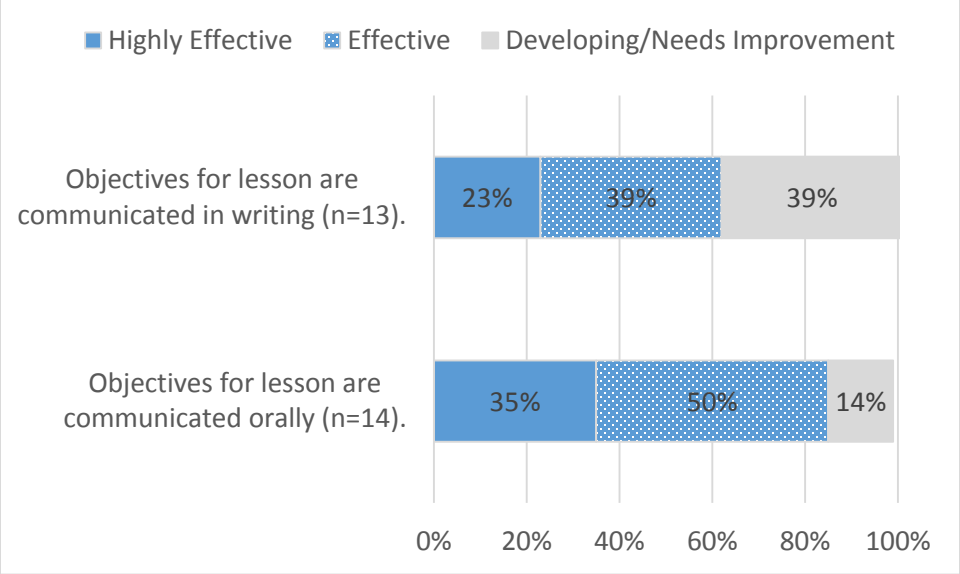


Figure 3: Level of effectiveness for identified planning practices in high school CTAE classes

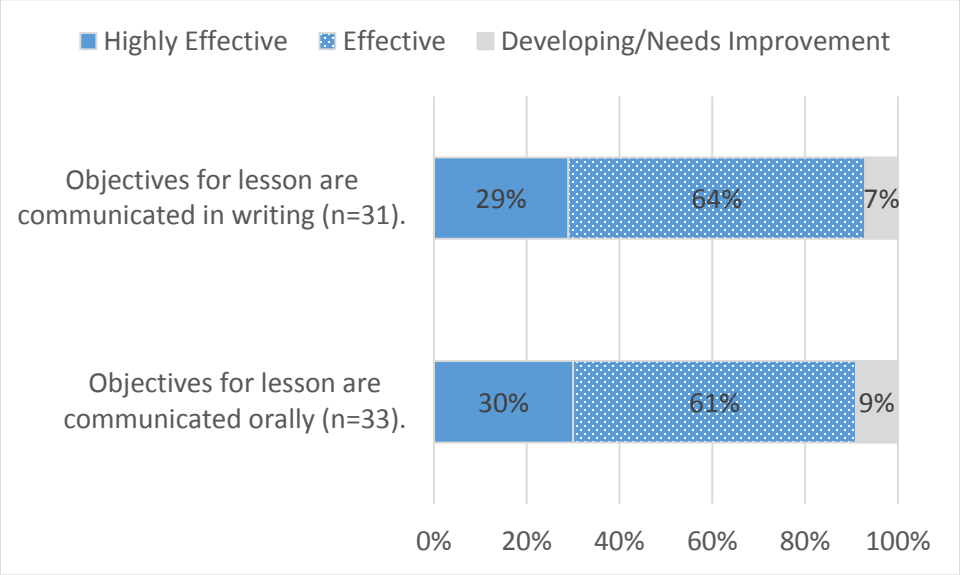
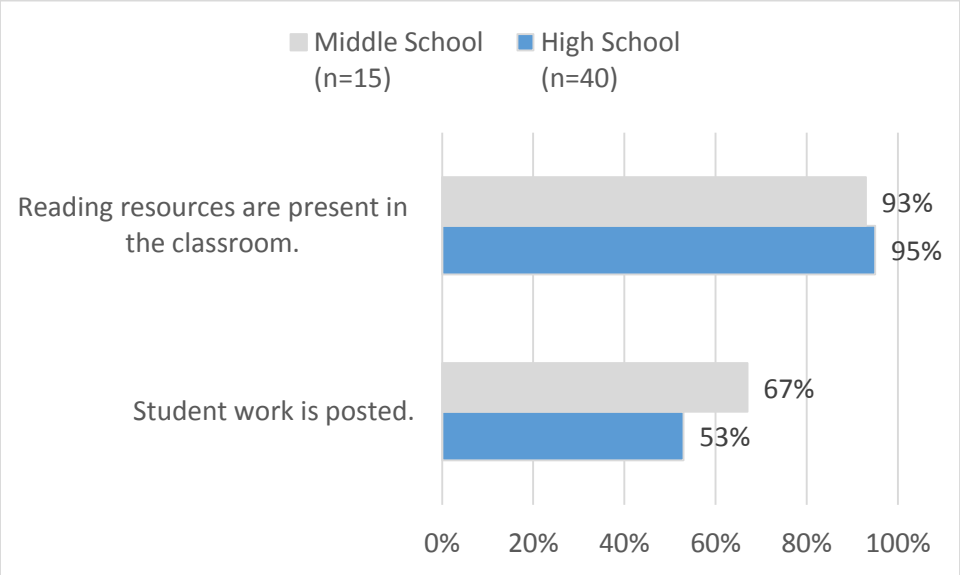


Figure 4: Percent of reading resources present or student work posted in observed in CTAE classrooms



During observations, observers noted that in middle school classes safety procedures were not applicable to 9 observations. In high school 24 out of 40 observations indicated that safety procedures were not applicable for teachers, and 23 out of 40 observation indicated that safety procedures were not applicable for students.

Figure 5: Percent of observations that indicated safety procedures being followed by teachers and students in middle school CTAE classes

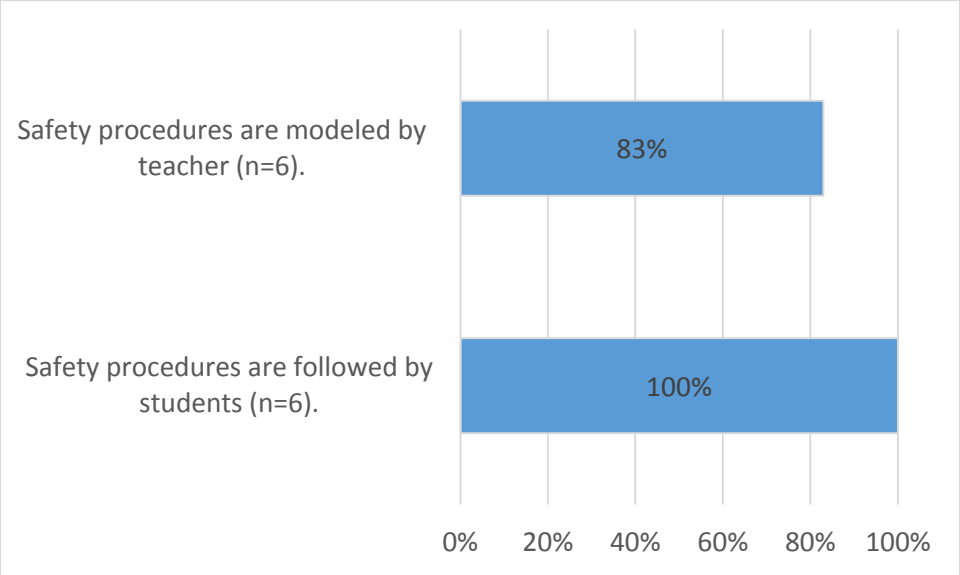


Figure 6: Percent of observations that indicated safety procedures being followed by teachers and students in high school CTAE classes

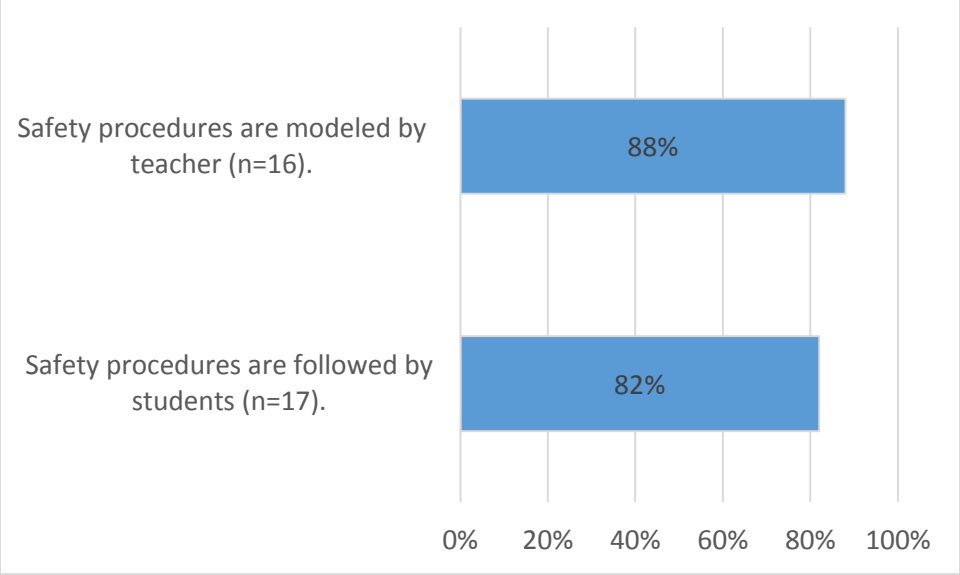


Figure 7: Level of effectiveness for identified safety procedures in middle school CTAE classes

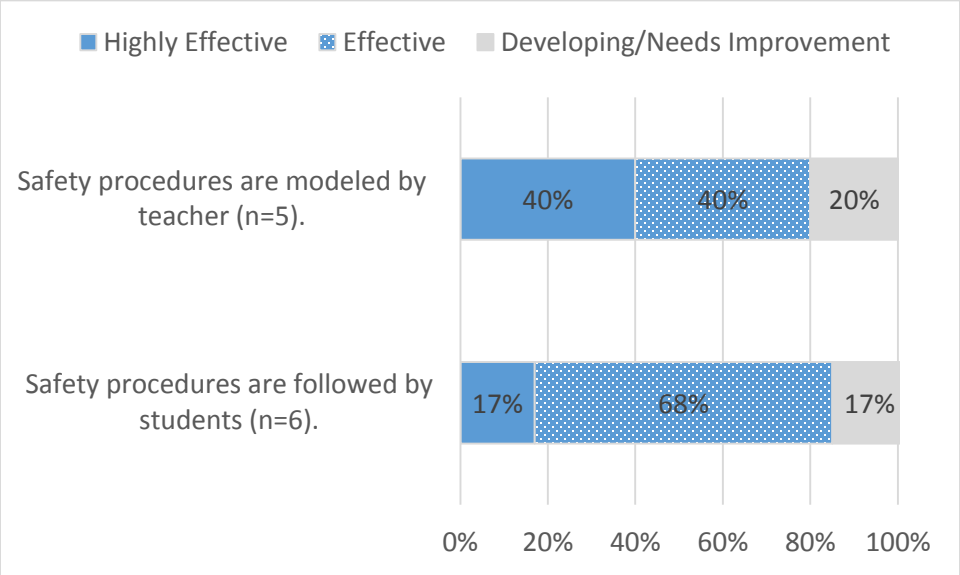


Figure 8: Level of effectiveness for identified safety procedures in high school CTAE classes

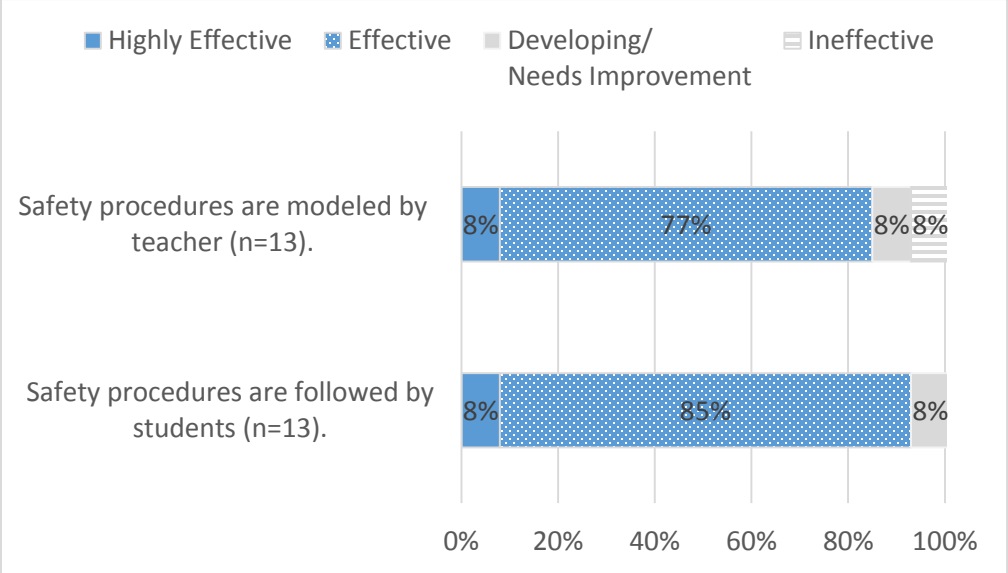


Figure 9: Percent of instructional teacher actions observed in CTAE classes

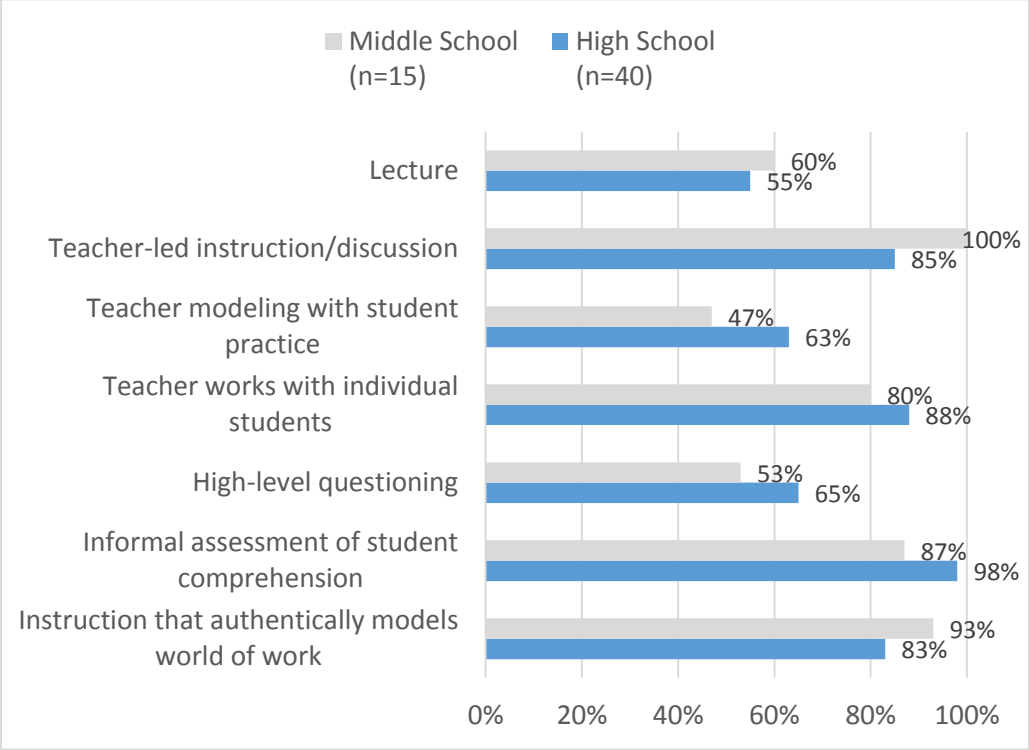


Figure 10: Level of effectiveness for identified instructional teacher actions in middle school CTAE classes

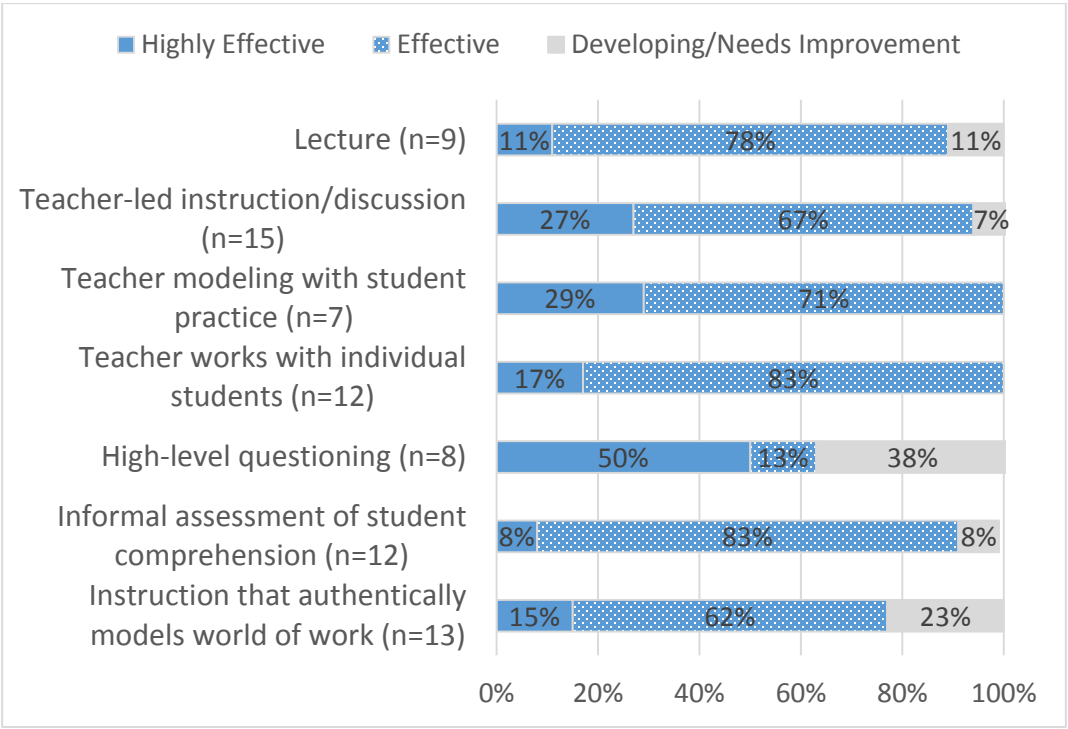


Figure 11: Level of effectiveness for identified instructional teacher actions in high school CTAE classes

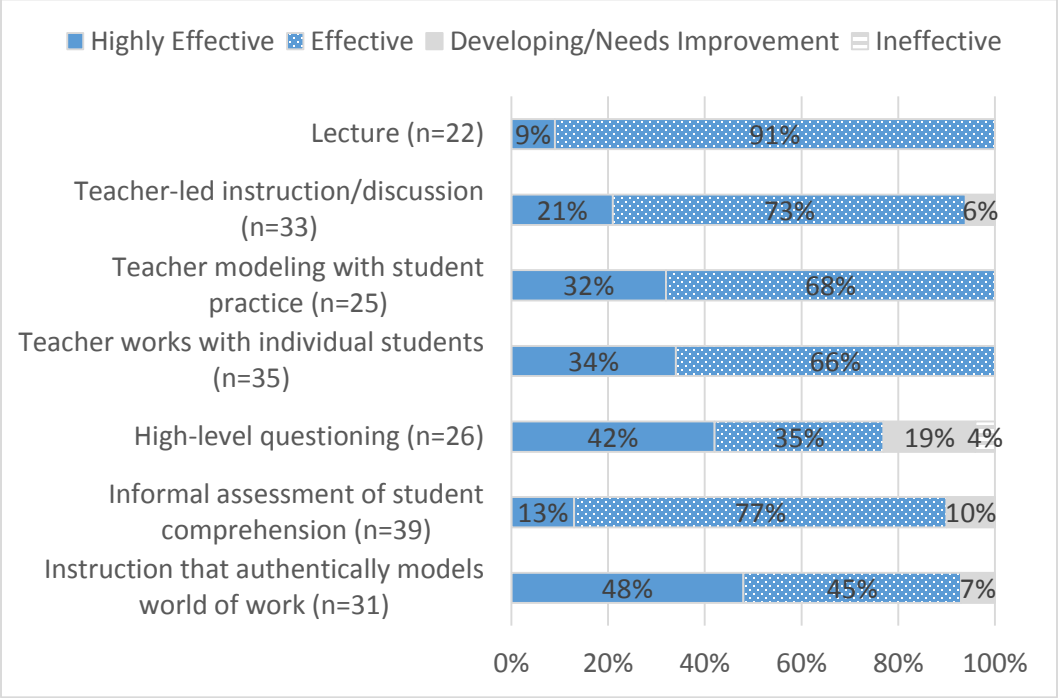


Figure 12: Percent of instructional student actions/activities observed in CTAE classes

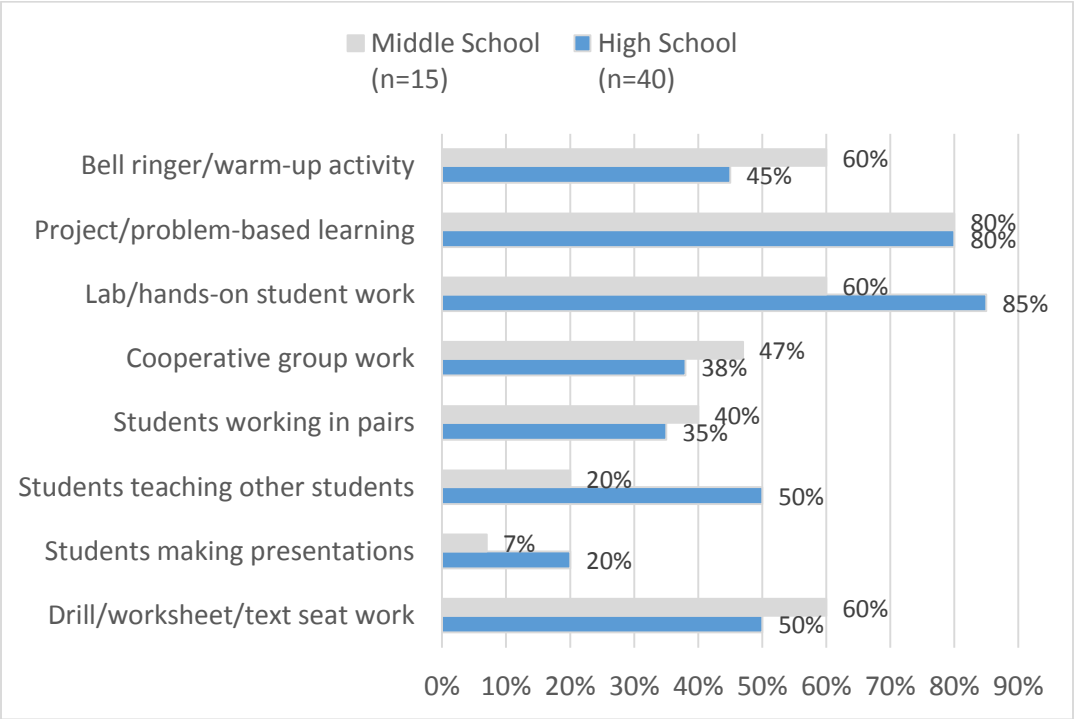
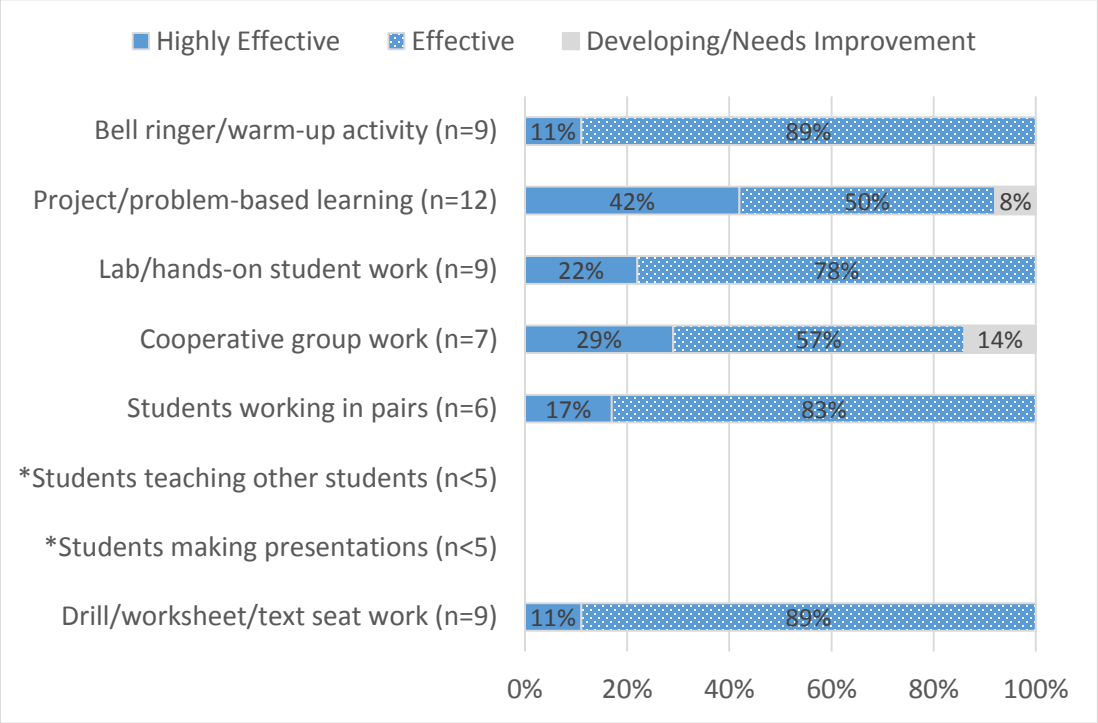


Figure 13: Level of effectiveness for identified student actions/activities in middle school CTAE classes



*Sample sizes with less 5 are not reported.

Figure 14: Level of effectiveness for identified student actions/activities in high school CTAE classes

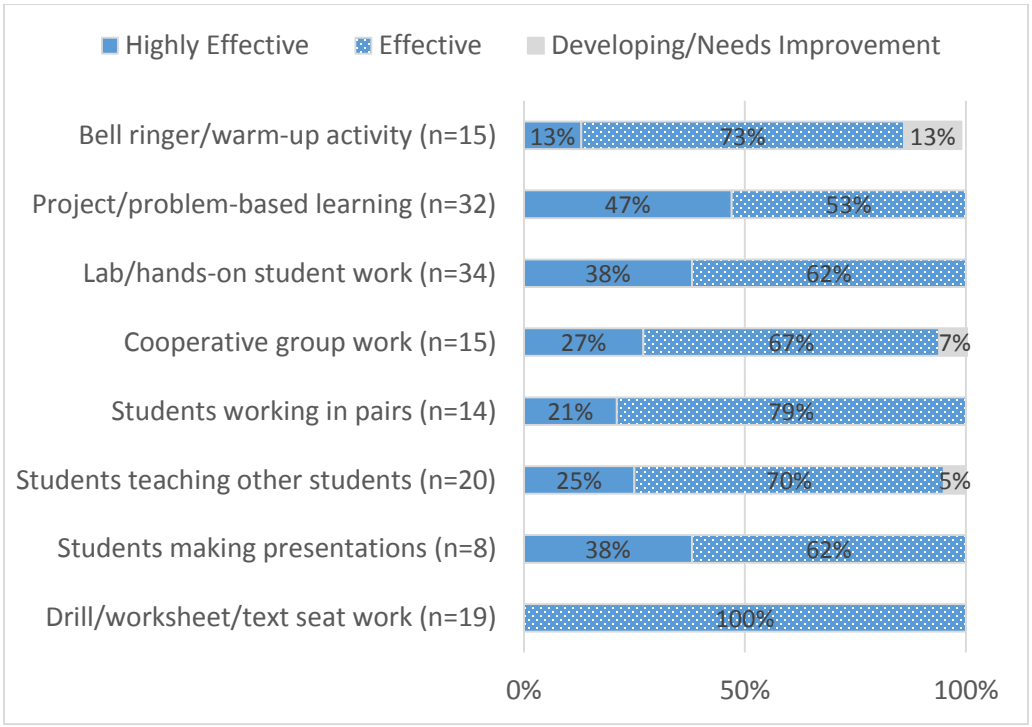


Figure 15: Percent of observations that did have lesson content and materials relate to lesson goals/objectives

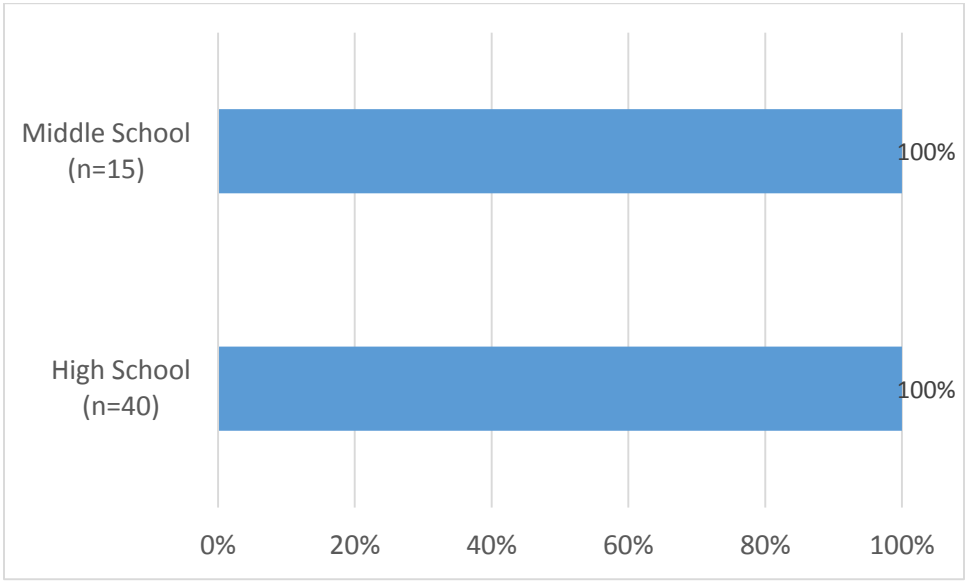


Figure 16: Level of effectiveness for lessons that related content and materials to goals and objectives

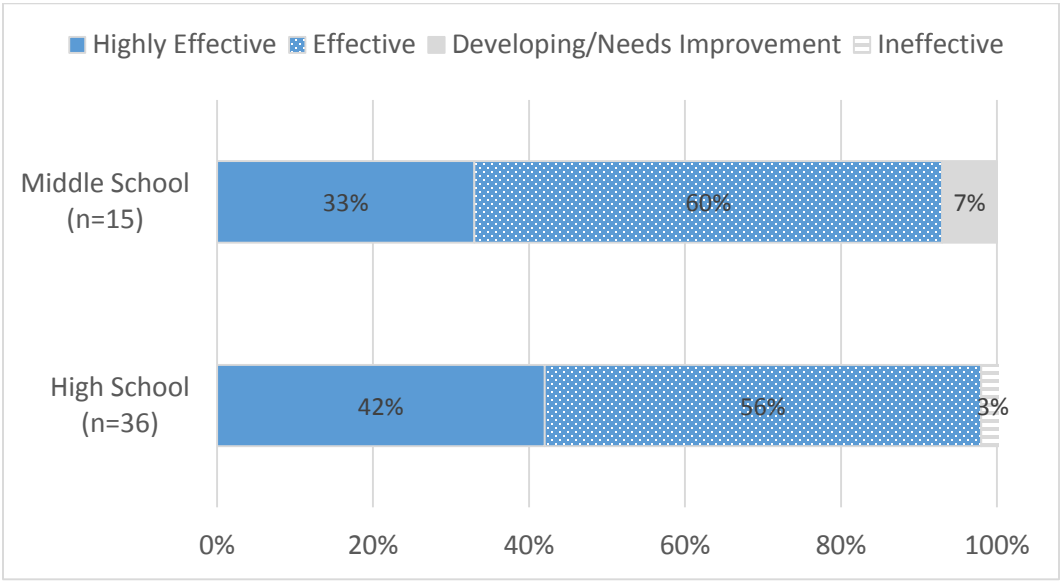


Figure 17: Percent of lessons with multidisciplinary connections

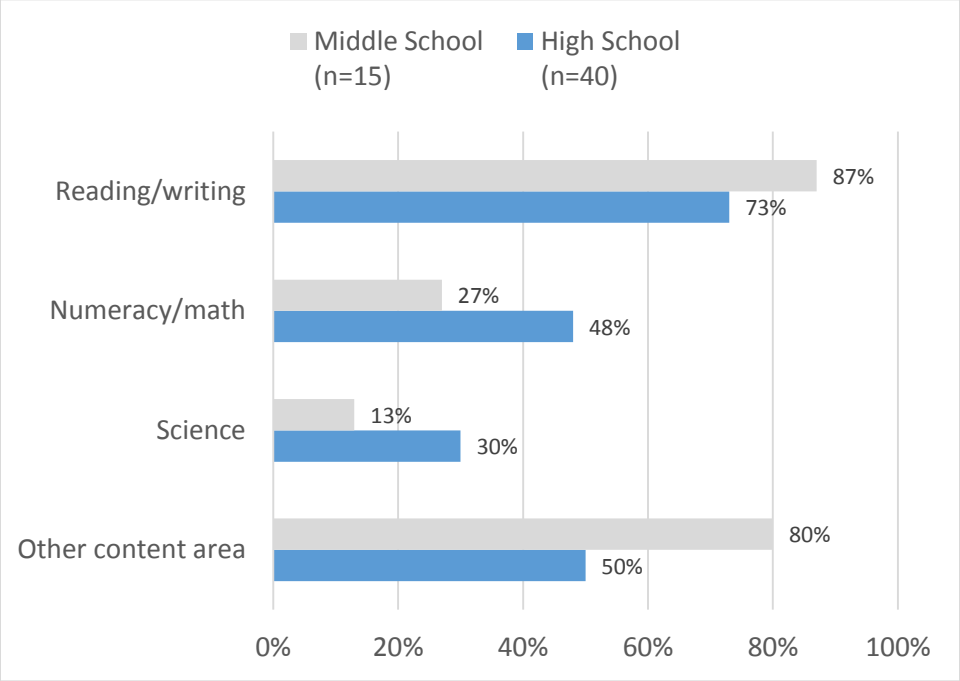
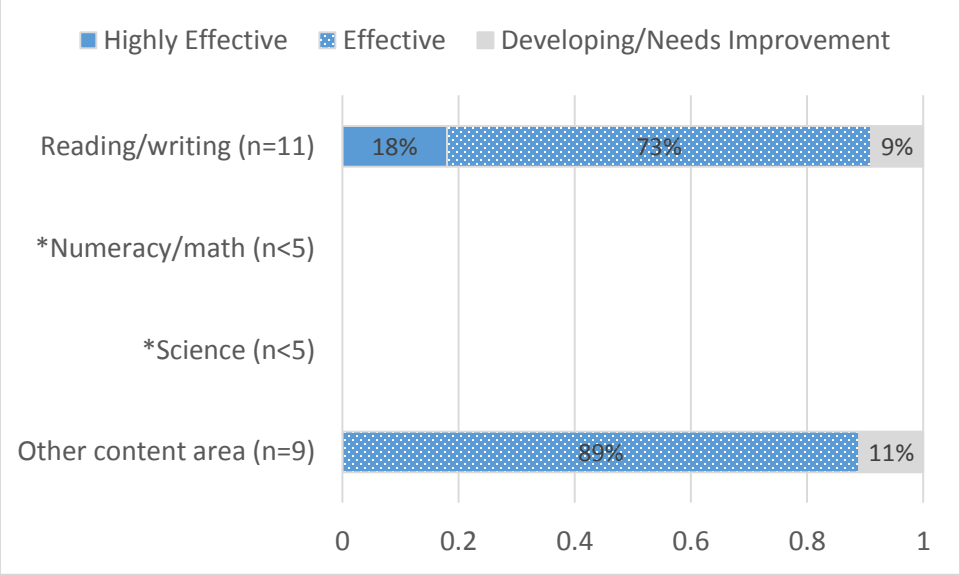


Figure 18: Level of effectiveness for middle school CTAE classes with multidisciplinary connections



*Sample sizes with less 5 are not reported.

Figure 19: Figure 20: Level of effectiveness for high school CTAE classes with multidisciplinary connections

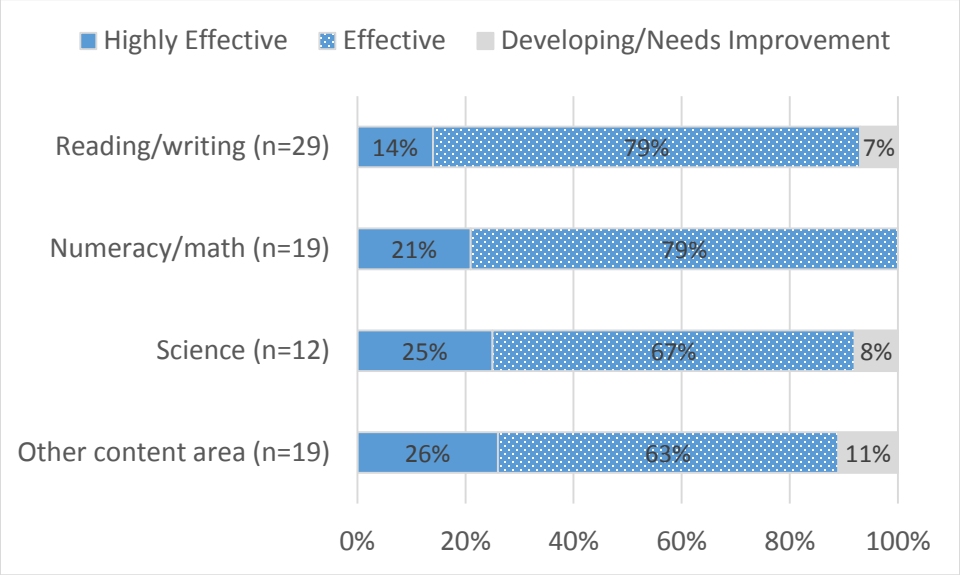


Figure 21: Percent of CTAE classes that utilize technology

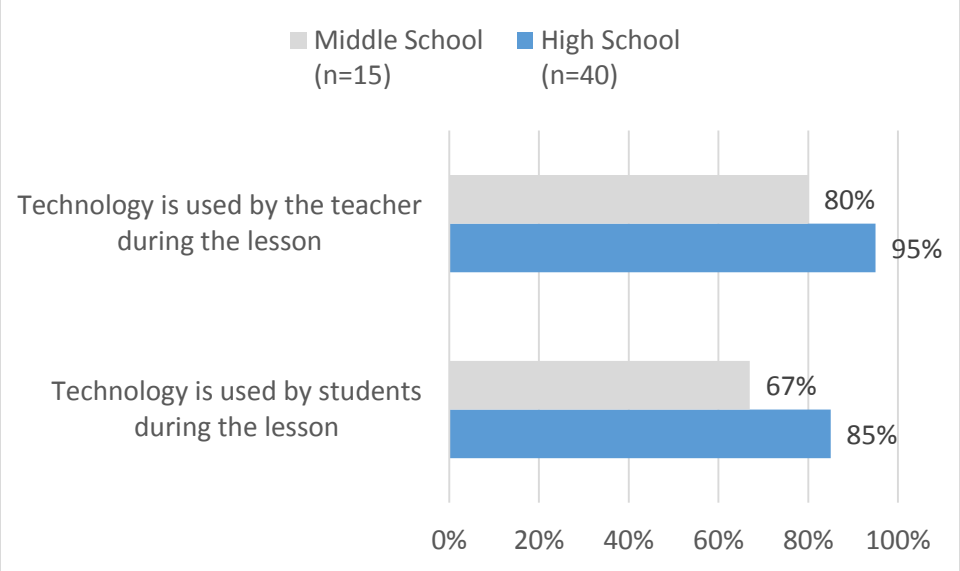


Table 1: The percent of observations that included engaging and interactive technology use

Technology Best Practices in CTAE Instruction	Middle School (n=13)	High School (n=39)
Technology is interactive	69%	74%
Technology is enhancing instruction and fostering understanding	100%	100%
Technology is engaging students in learning tasks	100%	90%
Technology is engaging students in creating a product/service	62%	77%
None of the above	0%	0%

*Two middle schools and one high school observation did not indicate technology being used in the lesson observed.