Standards-based Classroom Observation Protocol for Egypt (SCOPE)

Background data

Governorate: ❑ Alexandria ❑ Aswan ❑ Beni Suef ❑ Cairo ❑ Fayoum ❑ Minia ❑ Qena

❑ Other governorate_____

School name: _____ School code (see list): _____

Level: ❑ Primary ❑ Multi-grade ❑ Prep ❑ Secondary ❑ Technical ❑ Prep (Smart)

Grade (if applicable): ❑ 1 ❑ 2 ❑ 3 ❑ 4 ❑ 5 ❑ 6 ❑ 7 ❑ 8 ❑ 9 ❑ 10 ❑ 11 ❑ 12

Subject matter
❑ Arabic ❑ English ❑ Math ❑ Science ❑ Social studies ❑ Other (specify): _____

Teacher observed

Name _____ Code: _____ Sex: ❑ Female ❑ Male

Teaching experience: ❑ Less than 3 years ❑ 3–5 years ❑ 6–10 years ❑ More than 10 years

Designation: ❑ Teacher ❑ Senior teacher ❑ Master teacher (i.e., received training abroad)

Education: ❑ Ed Prep ❑ Bachelor's ❑ General diploma ❑ Special Diploma ❑ Master's

Professional development activities during past three years

Frequency per year: ❑ None ❑ Once a year ❑ 2–3 times a year ❑ More than 3 times a year

Agency/project (check all that apply): ❑ Egyptian (MOE) ❑ Non-Egyptian ❑ NSP

Average duration: ❑ Less than a day ❑ 1–2 days ❑ 3–5 days ❑ More than five days

Lesson observed

Physical setting and instructional resources

❑ Fixed seats in rows ❑ Moveable seats in rows ❑ Moveable seats in alternative arrangements

Availability of instructional materials and aids: ❑ None ❑ Some ❑ Ample

Availability of technology for teaching: ❑ none ❑ 1-3 functioning computers ❑ Activity lab ❑ Other_____

Number of students in the classroom: _____ ❑ All-male ❑ All-female ❑ Co-Ed

List the topic of the lesson and the major activities undertaken by the teacher and students during the lesson as derived from raw classroom observations

Observer name: _____ Observer code (see list): _____

Observation: Date _____ Time stared _____ Time ended _____

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- Rate each of the following statements on teacher and student behaviors on the scale from 1 to 5. Check only *one* rating for each statement.
- Attach your classroom observation data and notes to the completed form.

THE TEACHER:	**RATING** 1	2	3	4	5
1. Manages instructional time effectively					
2. Demonstrates effective classroom management skills					
3. Makes effective use of different instructional resources and strategies to explain and model subject matter concepts and skills					
4. Engages students in carefully structured cooperative learning experiences					
5. Implements instruction that targets the development of students' social and collaborative skills					
6. Actively ensures the participation of all students in learning activities irrespective of their sex, achievement level, special needs, giftedness and other differences					
7. Uses diverse instructional strategies to promote active student participation in learning					
8. Effectively asks probing and open-ended questions that encourage thinking, and help students explicate their thinking					
9. Encourages students to have a voice in the learning environment					
10. Provides students with opportunities to build meaningful connections between different subject matter areas, and between these areas and everyday life experiences					
11. Provides students with structured opportunities to apply their understandings and skills to everyday life situations and problems					
12. Provides students with structured opportunities to reflect on their own learning					
13. Provides and helps students suggest ample, specific, and constructive feedback					
14. Uses student prior knowledge and experiences to plan and adjust instruction					
15. Provides students with opportunities to practice higher order and critical thinking skills					
16. Provides students with opportunities to develop problem solving skills					
17. Uses technology and/or other tools to increase opportunities for exploration, manipulation of knowledge, and hands-on learning *****					

THE STUDENTS:	1	2	3	4	5
18. Gather, classify, analyze, and synthesize evidence and/or information and make defensible inferences					
19. Ask critical questions or make critical comments regarding information, ideas, and assumptions discussed in textbooks or class					
20. Define problems and come up with questions for further investigation					
21. Provide alternative approaches to solving similar problems					
22. Assess the effectiveness of alternative approaches to solving a problem and defend the most effective approach					
23. Utilize technology tools in ways that help them to manipulate knowledge, explore, and practice *****					

** TILO Indicator*

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1. Manages Instructional Time Effectively

1	2	3	4	5	Rate
Instructional time is poorly planned and managed. Too much time is wasted on or because of: classroom management issues, lack of effective routines to collect and distribute paperwork and materials, transitions between instructional activities, lack of clear instructions that prevent the effective completion of instructional activities, poor or lack of preparation of instructional materials, or poor planning or sequencing of instruction that requires the teacher to frequently go back and forth in terms of explanations, questions, or directions. Activities and classroom discourse are *severely* disconnected.	**Instructional time is not well planned or managed.** As much as one-third of instructional time is wasted on or because of: classroom management issues, lack of effective routines to collect and distribute paperwork and materials, transitions between instructional activities, lack of clear instructions that prevent the effective completion of instructional activities, poor or lack of preparation of instructional materials, or poor sequencing of instruction that requires the teacher to frequently go back and forth in terms of explanations, questions, or directions. Activities and classroom discourse *remain* disconnected.	**Instructional time is reasonably planned and managed.** The teachers makes a concerted effort to: manage the classroom effectively, establish effective routines to collect and distribute paperwork and materials, ensure smooth transitions between instructional activities, provide very clear instructions that allow students to effectively complete instructional activities, prepare instructional materials ahead of time, effectively plan and sequence instruction to virtually eliminate wasting time by frequently going back and forth during instruction. However, activities and classroom discourse *could* still feature disconnectedness.	**Instructional time is well planned and managed.** Very little time is wasted because the teacher: manages the classroom effectively, established effective routines to collect and distribute paperwork and materials, ensures smooth transitions between instructional activities, provides very clear instructions that allow students to effectively complete instructional activities, prepares instructional materials ahead of time, effectively plans and sequences instruction to virtually eliminate wasting time by frequently going back and forth during instruction. The connectedness of activities and classroom discourse is *minimally* disrupted.	**Instructional time is effectively planned and managed.** Virtually no time is wasted because the teacher: manages the classroom effectively, established effective routines to collect and distribute paperwork and materials, ensures smooth transitions between instructional activities, provides very clear instructions that allow students to effectively complete instructional activities, prepares instructional materials ahead of time, effectively plans and sequences instruction to virtually eliminate wasting time by frequently going back and forth during instruction. Both activities and classroom discourse are *connected*.	

2. Demonstrate Effective Classroom Management Skills

1	2	3	4	5	Rate
The approach to classroom management clearly hinders establishing an environment conducive to learning. The teacher is preoccupied with managing student behavior. An effective classroom management plan seems to be absent. There does not seem to be clear expectations for acceptable and unacceptable student behavior. The teacher is inconsistent in handling student misbehavior. *Shouting and threats or enactment of punitive measures* (including ones bearing on student failure and success) *are used to manage the class.* Consequences might inflict *psychological harm* on students or place them in *unduly stressful* situations.	**The approach to classroom management clearly interferes with establishing an environment conducive to learning.** The teacher spends more time than needed on classroom management. A management plan specifying acceptable and unacceptable student behavior seems to be in place. However, consequences are either inappropriate or applied inconsistently. Students are *occasionally* placed in unduly stressful situations.	**Classroom management interferes only minimally with building an effective learning environment.** A management plan with clear expectations for acceptable student behavior and consequences for misbehavior seems to be in place. The teacher spends some time dealing with student behavior and/or does not apply the plan consistently. Consequences are mostly reasonable and fairly effective. However, while rare, the teacher *might* place a misbehaving student in an unduly stressful situation.	**The classroom management plan contributes to fostering an environment conducive to learning.** Classroom management takes very little away from instructional time. An effective plan seems to be established with clear expectations for acceptable student behavior and consequences for misbehavior. The teacher applies the plan consistently across settings or activities. While effective, planned consequences for students are *fair* and reasonable.	**The classroom management plan clearly contributes to fostering an environment conducive to learning.** Classroom management takes almost no time away from instruction. An effective plan seems to be established with clear expectations for acceptable student behavior and consequences for misbehavior. The teacher applies the plan consistently across settings or activities. While effective, planned consequences for students are fair and reasonable. The teacher's time and energy is clearly *shifted* from managing classroom behavior to managing substantive learning experiences.	

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3. Makes Effective Use of Different Instructional Resources and Strategies to Explain and Model Subject Matter Concepts and Skills

1	2	3	4	5	Rate
Instructional resources used to introduce concepts or skills are severely restricted. Instruction is limited to chalk-and-talk. Strategies are expository and limited to verbal teacher discussions or descriptions of target concepts and/or skills. Instructional resources are limited to the use of the black board, textbooks, and student notebooks.	**Different instructional resources and strategies are used to introduce concepts and skills. However, this use does not support student learning of the target concepts or skills.** Resources include visual organizers, posters, models, and ready-made kits. However, resources are either not well aligned with the target concept or skills, or the teacher is not successful in helping students recognize connections between the instructional resources and these concepts or skills.	**A variety of instructional resources and strategies are effectively used to introduce concepts and skills. The strategies, however, are teacher-centered and the resources are either ready-made or designed and built by the teacher.** Resources include visual organizers, posters, models, and ready-made kits. The teacher points out connections between these resources and target concepts and skills.	**A variety of instructional resources and strategies are effectively used to introduce concepts and skills. Students are actively engaged with using, designing, and/or building the resources.** Resources include visual organizers, posters, think-aloud methods, models, manipulative, role plays, journals, songs, experiments, projects, or ready-made kits. ***However,*** only limited time is provided for students to engage these instructional resources and/or limited opportunities are provided to help them understand connections between the resources and the target concepts or skills.	**A variety of instructional strategies and resources are used to introduce concepts and skills. Students are actively engaged with using, design-ing, and/or building the resources, *and* given ample time to engage the resources and build connections.** Resources include visual organizers, think-aloud methods, posters, models, manipulative, role plays, journals, songs, experiments, projects, or ready-made kits. Students ***are*** given ample time to engage these instructional resources and opportunities to understand or build connections between the resources and the target concepts or skills.	

4. Engages Students in Carefully Structured Cooperative Learning Experiences

1	2	3	4	5	Rate
Students work individually at their individual desks, shared desks, or tables.	**Students are put in small groups of 3–6 to complete a certain task. However, group formation and tasks are poorly thought out and structured.** Group formation and tasks do not reflect principles of cooperative learning.	**Students work in small groups of 3–4 selected by the teacher on the basis of some criterion. Group members are assigned a clear task. However, cooperation is not evident in student interactions.** The teacher clearly attempts to structure the task so that all students are encouraged to work together. Such cooperation, however, is not well achieved because principles of cooperative learning and not implemented.	**Students work in carefully structured heterogeneous groups of 3–4. They are engaged in learning that clearly features positive interdependence, individual accountability, and face-to-face promotive interaction.** Student sex, achievement level, and other factors are used to form heterogeneous groups.	**Students work in carefully structured heterogeneous groups of 3–4. Students are engaged in learning experiences that clearly reflect all basic elements of cooperative learning.** The basic elements of cooperative learning include: Positive interdependence, individual accountability, face-to-face promotive interaction, equal opportunity for success, and group processing	

5. Implements Instruction that Targets the Development of Students' Social and Collaborative Skills

1	2	3	4	5	Rate
Social and collaborative skills are not part of classroom discourse. There is rare mention of these skills and only in passing.	**The teacher occasionally mentions some broad social and collaborative skills during instruction and discusses their importance in learning and everyday life.** *However*, the teacher does not go beyond talking about these skills.	**The teacher discusses some broad social and collaborative skills, informs students they are expected to use them in class, but does *not* collect systematic data on performance.** The teacher follows up by providing students with some feedback about their "performance." The feedback, however, is not based on observations of students as they work in groups.	**The teacher outlines one or two specific basic or intermediate level skills, models their use, collects systematic data, and provides students with specific feedback on their performance.** The specific skills could be basic or intermediate social and collaborative skills. These include group forming and functioning skills. The teacher collects systematic data as students engage in group work by taking notes or using a checklist. The data are used to provide students with feedback.	**The teacher outlines one or two specific high level skills, models their use, collects data, and provides students with feedback *or* provides an opportunity for students to do a self-assessment.** The specific social and collaborative skills are high level skills, such as formulating and fermenting skills. The teacher collects systematic data through taking notes or using a checklist. The data are used to provide students with feedback *or* students are provided the data and asked to assess their own performance.	

6. Actively Ensures the Participation of all Students in Learning Activities Irrespective of their Sex, Achievement Level, Special Needs, Giftedness and other Differences

1	2	3	4	5	Rate
The teacher mostly engages certain groups of students in significant learning experiences. For instance, the teacher calls on more boys than girls, more high achievers than low achievers, more students in the front of the classroom, fewer well groomed students, etc., to address the class, answer challenging questions, serve as group leaders, be acknowledged, engage significant learning activities (e.g., solving problems) or assume tasks perceived to be significant by other students.	**The teacher is unaware or only somewhat aware of dimensions of diversity in the classroom. The teacher only superficially engages all students in learning**. Student engagement remains differential. For instance, most girls and low achievers are engaged but only through answering low level questions and assuming marginal roles during group work.	**The teacher is aware of dimensions of diversity in the classroom. The teacher *tries* to engage all students in the classroom in learning activities.** ***However,*** the teacher does not seem to have systematically planned the engagement of all students. Some groups are occasionally left out.	**The teacher is clearly aware of dimensions of diversity in the classroom. The teacher consciously and systematically engages all students.** The engagement of all students is planned and involves significant learning activities and tasks. All students are involved irrespective of their sex, achievement level, socioeconomic status, and other differences.	**The teacher engages *all* students in learning, *and* provides planned opportunities to support students with special learning needs and provide gifted students with more challenging learning tasks.** The engagement of all students is planned and involves significant learning activities and tasks. All students are involved irrespective of their sex, achievement level, socioeconomic status, and other differences. Additionally, special provisions are made for students with special learning needs and gifted students.	

7. Uses Diverse Instructional Strategies to Promote Active Student Participation in Learning

1	2	3	4	5	Rate
The lesson features a teacher-centered, lecture-recitation instructional approach. Student participation is limited to chorus or individual answering of convergent questions or completing drill-and-practice, paper-and-pencil activities at student desks or on the board.	**The lesson features an interactive *teacher-centered*, lecture-discussion instructional approach.** While students remain mostly inactive at their desks, they are engaged in thinking about and answering open-ended questions that require them to synthesize the materials being presented. Students, however, are not engaged in the "doing."	**The lesson features an instructional strategy that engages students in hands-on activities related to the target content.** There is some level of student-student and student-teacher *discourse*, but it is mostly procedural and centered around the completion of the task. Connections between the hands-on task and target ideas or skills are weak or not made explicit through a post-activity, minds-on discussion.	**At least two instructional strategies are used to engage students in hands-on and minds-on tasks. *However*, the focus is disciplinary. Links to student experiences and needs are *not* prominent.** Student-student and student-teacher *discourse is more prominent* and focused on both procedural and substantive issues. Post activity discussions help students build clear links between activities and target content and skills.	**Different instructional strategies are used to involve students in *meaningful* group and individual work. Instruction clearly builds on student prior experiences, needs, and interests.** Meaningful work entails engaging students with hands-on and minds-on activities that encourage thinking, entail substantive student-teacher and student-student discourse, and clearly establishes links between the activities and target content or skills.	

8. Effectively asks Probing and Open-ended Questions that Encourage Thinking, and Help Students Explicate their Thinking

1	2	3	4	5	Rate
The teacher *predominantly* asks poorly distributed, convergent questions and fails to prompt struggling students. Convergent questions elicit from students specific and short responses related to the rhetoric of facts targeted in the lesson. The teacher does not attempt to rephrase questions or prompt students who struggle with answering and quickly moves to the next student. Questions are poorly distributed among students and wait-time is virtually non-existent.	**The teacher *occasionally* asks challenging questions that require students to connect different ideas.** However, the teacher still mostly asks convergent questions aimed at eliciting specific student responses related to the rhetoric of facts targeted in the lesson. The teacher is *more effective* in asking questions in terms of wait-time (ask-wait-call), distribution among students, rephrasing questions, and prompting struggling students.	**The teacher *frequently* asks open-ended questions that require students to think about and connect ideas.** The teacher uses convergent questions to a *much lesser* extent and when appropriate. The teacher *occasionally* asks follow-up, probing, and clarifying questions that help students to explicate and clarify their thinking about the ideas targeted in the lesson. *However*, the teacher is less effective in asking questions in terms of wait-time (ask-wait-call) and distribution among students.	**The teacher *frequently* asks open-ended, *as well as* follow-up, and probing questions that help students explicate and extend their thinking.** The teacher uses convergent questions *only* when appropriate. The teacher is *clearly effective* in asking questions in terms of wait-time (ask-wait-call), distribution among students, and redirecting questions to students.	**The teacher *predominantly* asks open-ended, follow-up, and probing questions *both* within the context of the lesson and in relation to other contexts.** "Other contexts" include other content areas and everyday life experiences. The teacher uses convergent questions only when appropriate. The teacher is clearly effective in asking questions in terms of wait-time (ask-wait-call), distribution among students, and redirecting questions to students.	

9. Encourages Students to have a Voice in the Learning Environment

1	2	3	4	5	Rate
Students have no voice in the learning environment. Student voice and discourse is limited to answering teacher questions and prompts. Students rarely ask any questions of the teacher. Students are not asked or encouraged to share their personal ideas, experiences, views, and/or feelings in relation to the target topic. Students have no say about the content, nature, and pace of instructional activities.	**Students have a limited voice in the learning environment.** In addition to answering teacher questions and prompts, students are occasionally asked to articulate their ideas related to the subject matter concepts targeted in the lesson. Student questions are limited to asking the teacher to repeat a direction or other statements. Students remain silent as to the content, nature, and pace of instructional activities.	**Student voice is somewhat a part of the learning environment.** Students answer and ask substantive questions of the teacher related to the target content or skills. *In particular,* students are at ease in asking the teacher to re-explain a concept or procedure. Students are occasionally encouraged to share their personal ideas, experiences, views, and/or feelings in relation to the target topic. ***However,*** the teacher does not seem to act on the elicited student responses. By asking clarification questions, students have some say in the pace of instructional activities.	**Student voice is heard and factored into the learning environment.** Students answer and ask substantive questions of the teacher related to the target content or skills. *In particular,* students are at ease in asking the teacher to provide alternate explanations or representations of a concept or skill. Students are often encouraged to share their personal ideas, experiences, views, and/or feelings in relation to the target topic. The teacher ***acts*** on the elicited student responses by adjusting the pace of or approach to an activity. Thus, students have *some* say in the pace and nature of instructional activities.	**Student voice is an integral part of the learning environment.** Students answer and ask substantive questions of the teacher related to the target as well as other relevant topics. Students are often asked or take initiative without prompt to share their personal ideas, experiences, views, and/or feelings in relation to substantive topics. Student input is factored into the learning environment by ***adjusting*** the pace and nature, as well as content (within reasonable limits) of instructional activities. Thus, students have a say in the pace, nature, and (to some extent) content of instruction.	

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10.Provides Students with Opportunities to Build Meaningful Connections between Different Subject Matter Areas, and Between these Areas and Everyday Life Experiences

1	2	3	4	5	Rate
The lesson is self-contained. The focus is exclusively disciplinary. The teacher makes no attempts to suggest or build links between the disciplinary ideas targeted in the lesson and other content areas or student everyday life experiences.	**The teacher makes a *few* statements to link disciplinary ideas in the lesson to other content areas and/or student everyday life experiences.** Students are ***not*** asked or encouraged to suggest such links themselves. The teacher statements, ***however,*** are transient and do not seem to be planned within the context of the lesson.	**The teacher makes *frequent* references to ways in which disciplinary ideas connect to ideas in other disciplines and to everyday life situations.** The teacher asks and encourages *students* to make such connections themselves. *However*, it is clear that the links made or built during the lesson are not coordinated with ideas explored in other disciplines: The teacher does not seem to have planned the connections with teachers in other disciplines.	**The teacher plans for and integrates ideas and skills from other disciplines or everyday life experiences within instruction.** The links *clearly* support and enrich learning of the target disciplinary ideas. For example, the teacher brings up specific content or skills that were learned or are being learned in other content areas and asks students to think about ways in which these ideas connect or support each other. Similar connections are made with everyday life experiences. It is *clear* that the links made are planned and coordinated: The teacher is well informed about what is being taught and learned in other content areas in the current or prior years.	**The lesson presents *seamless integration* between content, and/or skills from two or more content areas and/or everyday life experiences.** The lesson provides *students* with structured opportunities to learn content and/or skills in the context of two or more disciplinary contexts. For example, students use mathematical skills (e.g., geometry, arithmetic) to map out agricultural areas and associated production capacities in their governorate during a social studies lesson. Connections and links, while carefully planned, are fully integrated and seamless.	

11. Provides Students with Structured Opportunities to Apply their Understandings and Skills to Everyday Life Situations and Problems

1	2	3	4	5	Rate
The lesson activities focus on applying student knowledge, understandings, and skills solely to academic settings and problems. For example, students complete end-of-chapter book exercises, fill in the blanks or provide short answers to questions on worksheets to apply grammatical rules, calculate the areas of different geometrical shapes that appear on a worksheet, apply scientific formulae to word problems, etc.	**Students are *occasionally* asked to apply their knowledge, understandings, and skills to well-defined and structured everyday life situations and problems.** While more meaningful, these situations and problems are *not* genuinely different from academic ones and draw on a single content area. The outcome is fairly specific. For example, students are asked to calculate how much carpet is needed to furnish their home wall-to-wall, which requires them to apply arithmetic skills to a meaningful but well-defined situation. Opportunities to engage with such application, however, are sporadic, transient, and not well planned.	**Students are *frequently* asked to apply their knowledge, understandings, and skills to well-defined and structured everyday life situations and problems.** Opportunities to engage with such application seem to be *regular and planned* aspects of the lesson. While more meaningful, these situations and problems are not genuinely different from academic ones and draw on a single content area. The outcome is fairly specific.	**Students are *occasionally* asked to apply their knowledge, understandings, and skills to well-defined but not well-structured everyday life situations and problems.** These situations and problems require students to draw on, at least, two different content areas. The outcome is less specific and depends on a very small number of assumptions that students need to make. For example, students are asked to estimate the amount of water needed for the optimal growth of two crops in a village while taking into account a small number of variables (e.g., type of soil and seasonal changes of temperature). The opportunity to engage with such application is well planned.	**Students *occasionally* apply their knowledge, understandings, and skills to ill-defined and/or ill-structured everyday life situations and problems.** These situations and problems require students to draw on several content areas. A small number of assumptions is needed to define and approach the problem. The outcome is less important than the process itself. For example, students are asked to propose a plan to reduce pollution in Cairo. The opportunity to engage with such application is well planned.	

12.Provides Students with Structured Opportunities to Reflect on their Own Learning

1	2	3	4	5	Rate
Opportunities for reflection and self-assessment are absent. Students are not provided opportunities to assess their own learning, performance, or progress, or to examine how their ideas about target topics or target skills developed over the course of instruction.	**Students are provided *rare* and *short-lived* opportunities to examine their own learning, progress, or performance.** For example, after correcting homework on solving second degree equations in arithmetic, the teacher asks students to look over their solutions, see "where they went wrong," and make necessary corrections. Students, however, are not given an opportunity to verbalize or articulate their reflections or assessments.	**Students are provided *frequent* but short-lived opportunities to assess their own learning, progress, or performance.** These opportunities, ***however,*** remain short-lived and do not involve the collection or examination of data about student learning and performance. Students could also be asked to examine how their ideas about target topics or target skills developed over the course of instruction.	**Students are provided *occasional, extended* opportunities to assess their own learning, progress, or performance.** These opportunities ***require*** students to examine data and make inferences about their performance. Students could also be asked to examine how their ideas about target topics or target skills developed over the course of instruction. For example, during a cooperative learning activity, the teacher collects data about the frequency with which group members actually practiced two specific social skills. At the end of the activity, group members are provided and asked to examine the data and come up with an assessment about how well they did (self-assessment).	**Students are provided *occasional, extended* opportunities to assess their own learning, and set improvement goals and monitoring strategies.** These opportunities ***require*** students to examine data and make inferences about performance. ***Additionally,*** students are asked to set improvement goals and suggest ways to monitor their progress. For example, in addition to what students did under the rating (4), the teacher asks students to suggest ways to help group members engage the target social skills in the next cooperative learning activity more effectively, to set specific tenable goals, and to suggest the sort of data that the teacher would collect to help the students assess the achievement of their goals.	

13.Provides and Helps Students Suggest Ample, Specific, and Constructive Feedback

1	2	3	4	5	Rate
Teacher verbal feedback is *exclusively* brief, evaluative, general, uninformative, and not constructive. The feedback is focused on the person of students as compared to their ideas or thinking, focused on answers or products rather than process, and not-constructive. For example, the teacher asks a student to apply a rule to a problem on the blackboard. A student comes to the board, applies the rule, and comes up with a "wrong" answer. The teacher says "You did not get it right. Please go back to your seat and try to study harder so that next time you can get this right. Who else can solve this problem?" This feedback is directed at the student's person, is dismissive, does not explain what went "wrong," and does not suggest a specific course of action for the student to follow.	**The teacher *rarely* provides verbal feedback that is elaborate, specific, informative, and constructive.** The feedback is focused on student ideas or performance, focused on both products and processes, and constructive. For example, in the situation described in (1) the teacher says, "This is a good *attempt*. However, the *procedure* that you used does not account for different units. This is why you did not get the right answer. Can you see that? Can you try to work on this again with the right units? All of you should be careful to make sure your units are converted to be compatible before applying the rule." The feedback is directed at the student's solution, is positive, diagnoses the problem, suggests a course of action, and shifts the focus away from the person of the student by addressing the whole class.	**The teacher *frequently* provides verbal feedback that is specific, informative, elaborate, and constructive.** The feedback is focused on student ideas or performance, focused on both products and processes, and constructive. ***However,*** the teacher is not consistent in providing the sort of feedback described above. Also, the teacher tends to ***revert*** to using the sort of feedback described under (1), even though infrequently.	**The teacher *consistently* provides verbal feedback that is specific, elaborate, informative, and constructive.** The feedback is focused on student ideas or performance, focused on both products and processes, and constructive The teacher does ***not*** use the sort of feedback described under (1).	**The teacher *consistently* provides verbal feedback that is specific, elaborate, informative, and constructive, *and* coaches students to do the same.** The feedback is focused on student ideas or performance, focused on both products and processes, and constructive. ***Additionally,*** the teacher encourages and coaches students to provide specific and constructive feedback to their classmates. The teacher elicits feedback from students and helps them recognize whether their feedback is acceptable and helpful or not. Some students are actively engaged in providing specific and constructive feedback to each other.	

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14.Uses Student Prior Knowledge and Experiences to Plan and Adjust Instruction

1	2	3	4	5	Rate
The teacher does *not* use student prior knowledge and experiences to plan and adjust instruction. The teacher does not seem to factor and build on what students know from their everyday life experiences into instruction. For example, the teacher does not build on student familiarity and experiences with local village crops in a social studies lesson on crop production. Student ideas are not elicited. Instead, the teacher solely focuses on textbook examples	**The teacher *rarely* and *ineffectively* uses student prior knowledge and experiences to plan and adjust instruction.** The teacher might ask students about their ideas in relation to a target topic, but does not proceed to build on these ideas when addressing the topic instructionally. For example, in a lesson on burning, the teacher might ask students what they thought happened when materials burned. Students would say that all materials loose weight after burning (a mis-conception). The teacher simply "corrects" students and proceeds with the lesson.	**The teacher *occasionally* and *effectively* uses student prior knowledge and experiences to plan and adjust instruction.** The teacher occasionally ***researches*** or *asks* students about their ideas in relation to a target topic. The teacher ***builds on*** these ideas when addressing the topic instructionally. For example, after learning about student ideas on burning (2), the teacher asks students to give examples of materials that loose weight when burning. The teacher then provides examples of materials that gain weight after burning (most metals)! The teacher challenges students to reconcile these facts and uses student ideas to introduce more accurate ideas about burning (as an oxidation process).	**The teacher *frequently* and *effectively* uses student prior knowledge and experiences to plan and adjust instruction.** The teacher occasionally ***researches*** or *asks* students about their ideas in relation to a target topic. The teacher ***builds on*** these ideas when addressing the topic instructionally. See example in (3)	**The teacher *consistently* and *systematically* integrates student prior knowledge and experiences into instruction.** The teacher clearly *plans* instruction that takes into account student prior knowledge and experiences. The lesson *revolves around* student prior experiences and ideas. For example, having learned about student ideas on burning, the teacher starts a lesson with an experiment in which students are asked to make predictions about the weight of several materials. The students then weigh, burn, and weigh the materials again. They examine their results and make inferences. The experience is used by the teacher to guide students to build more accurate conceptions of the process of burning.	

15. Provides Students with Opportunities to Practice Higher Order and Critical Thinking Skills

1	2	3	4	5	Rate
The teacher does *not* provide students with *effective* opportunities to practice higher order or critical thinking skills. The teacher does *not* provide students with opportunities to: (a) gather, classify, analyze, and synthesize evidence and/or information, (b) compare and contrast ideas, (c) make defensible inferences, ***and/or*** (d) develop the attitudes and skills to ask critical questions or make critical comments regarding information, ideas, and assumptions discussed in textbooks or class. For specific examples see the criteria for items 17 and 18.	**The teacher provides students with *rare* and opportunities to practice higher order or critical thinking skills.** The teacher provides students with *rare* opportunities to: (a) gather, classify, analyze, and synthesize evidence and/or information, (b) compare and contrast ideas, (c) make defensible inferences, ***and/or*** (d) develop the attitudes and skills to ask critical questions or make critical comments regarding information, ideas, and assumptions discussed in textbooks or class. For specific examples see the criteria for items 17 and 18.	**The teacher provides students with *occasional* and *effective* opportunities to practice higher order or critical thinking skills.** The teacher provides students with *occasional* opportunities to: (a) gather, classify, analyze, and synthesize evidence and/or information, (b) compare and contrast ideas, (c) make defensible inferences, ***and/or*** (d) develop the attitudes and skills to ask critical questions or make critical comments regarding information, ideas, and assumptions discussed in textbooks or class. For specific examples see the criteria for items 17 and 18.	**The teacher provides students with *frequent* and *effective* opportunities to practice higher order or critical thinking skills.** The teacher provides students with *frequent* opportunities to: (a) gather, classify, analyze, and synthesize evidence and/or information, (b) compare and contrast ideas, (c) make defensible inferences, ***and/or*** (d) develop the attitudes and skills to ask critical questions or make critical comments regarding information, ideas, and assumptions discussed in textbooks or class. For specific examples see the criteria for items 17 and 18.	**The teacher makes practicing higher order or critical thinking skills a *consistent* and *integral* part of the lesson.** The teacher plans a lesson with a central focus on providing students with *ample* and *extended* opportunities to: (a) gather, classify, analyze, and synthesize evidence and/or information, (b) compare and contrast ideas, (c) make defensible inferences, ***and/or*** (d) develop the attitudes and skills to ask critical questions or make critical comments regarding information, ideas, and assumptions discussed in textbooks or class. For specific examples see the criteria for items 17, and 18.	

16. Provides Students with Opportunities to Develop Problem Solving Skills

1	2	3	4	5	Rate
The teacher does *not* plan and provide students with *effective* opportunities to develop problem solving skills. The teacher does not provide students with opportunities to: (a) define problems, (b) come up with questions for further investigation, (c) provide alternative approaches to solving similar problems, ***and/or*** (d) assess the effectiveness of these alternative approaches. For specific examples see the criteria for items 19, 20, and 21.	**The teacher plans and provides students with *rare* opportunities to develop problem solving skills.** The teacher provides students with *rare* opportunities to: (a) define problems, (b) come up with questions for further investigation, (c) provide alternative approaches to solving similar problems, ***and/or*** (d) assess the effectiveness of these alternative approaches. For specific examples see the criteria for items 19, 20, and 21.	**The teacher plans and provides students with *occasional* and *effective* opportunities to develop problem solving skills.** The teacher provides students with *occasional* opportunities to: (a) define problems, (b) come up with questions for further investigation, (c) provide alternative approaches to solving similar problems, ***and/or*** (d) assess the effectiveness of these alternative approaches. For specific examples see the criteria for items 19, 20, and 21.	**The teacher plans and provides students with *frequent* and *effective* opportunities to develop problem solving skills.** The teacher provides students with *frequent* opportunities to: (a) define problems, (b) come up with questions for further investigation, (c) provide alternative approaches to solving similar problems, ***and/or*** (d) assess the effectiveness of these alternative approaches. For specific examples see the criteria for items 19, 20, and 21.	**The teacher makes developing problem solving skills a *consistent* and *integral* part of the lesson.** The teacher plans a lesson in which problem solving is a central focus. Students are provided with *ample* and *extended* opportunities to: (a) define problems, (b) come up with questions for further investigation, (c) provide alternative approaches to solving similar problems, ***and/or*** (d) assess the effectiveness of these alternative approaches. For specific examples see the criteria for items 19, 20, and 21.	

17. Uses Technology to Increase Opportunities for Exploration, Manipulation of Knowledge, and Hands-on Learning

1	2	3	4	5	Rate
The teacher does *not* use technology effectively to increase students' opportunities for exploration, manipulation of knowledge and hands-on learning. The teacher does not utilize technology, OR technology supported activities in class could have been done as well or even better without technology to: (a) introduce and manipulate information in new ways, (b) allow students to explore and experiment with different ideas, knowledge, or problem solving approaches, (c) increase the amount of hands-on practice in groups or individually.	**The teacher rarely uses technology effectively to increase students' opportunities for exploration, manipulation of knowledge and hands-on learning.** The teacher rarely attempts to use technology or other tools, to do any of the following: (a) introduce and manipulate information in new ways, (b) allow students to explore and experiment with different ideas, knowledge, or problem solving approaches, (c) increase the amount of hands-on practice in groups or individually. Less than 5 minutes per 250 minute periods, on average.	**The teacher occasionally uses technology effectively to increase students' opportunities for exploration, manipulation of knowledge and hands-on learning.** The teacher occasionally utilizes technology to do the following: (a) introduce and manipulate information in new ways, but rarely uses technology or tools to: (b) allow students to explore and experiment with different ideas, knowledge, or problem solving approaches, (c) increase the amount of hands-on practice in groups or individually. Technology supported activities could NOT have been done as well without technology or other tools. More than 5 minutes per 50 minute periods, on average, but RARELY for (b) and (c).	**The teacher frequently uses technology effectively to increase students' opportunities for exploration, manipulation of knowledge and hands-on learning.** The teacher frequently utilizes technologies or other tools to: (a) introduce and manipulate information in new ways, *as well as:* (b) allow students to explore and experiment with different ideas, knowledge, or problem solving approaches, (c) increase the amount of hands-on practice in groups or individually. Technology supported activities could NOT have been done as well without technology More than 5 minutes per 50 minute period, on average, and for combinations of EITHER (a), (b) and (c).	**The teacher *consistently* uses technology effectively and other resources as tools to improve the instructional process, and to increase students' opportunities for exploration, manipulation of knowledge and hands-on learning.** The teacher utilizes technology to do ALL of the following: (a) introduce and manipulate information in new ways, *as well as:* (b) allow students to explore and experiment with different ideas, knowledge, or problem solving approaches, *and* (c) increase the amount of hands-on practice in groups or individually. Technology supported activities could NOT have been done as well without technology More than 10 minutes per 50 minute period, on average, and for combinations of ALL of (a), (b) and (c).	

SCOPE +

Students Gather, Classify, Analyze, and Synthesize Evidence and/or Information and Make Defensible Inferences

1	2	3	4	5	Rate
No students are actively engaged with gathering, classifying, comparing and contrasting, analyzing, *and/or* synthesizing evidence and/or information and making defensible inferences. Students are either inactive or predominantly involved with traditional, didactic learning experiences, such as answering convergent questions, shouting out chorus responses, copying notes from the board, reciting information, etc.	**Only a few students (less than 10%) are actively engaged with gathering, classifying, comparing and contrasting, analyzing, *and/or* synthesizing evidence and/or information and making defensible inferences.** For example, in a science lesson on photosynthesis, students measure the growth rate of bean plants (through length of stalk, condition of leaves, etc.) they have been growing under several conditions (various conditions related to light, water, aeration, etc.), record the data, compare and contrast the growth of plants under the various conditions, and make inferences about those factors that affect photosynthetic processes.	**Some students (around 30%) are actively engaged with gathering, classifying, comparing and contrasting, analyzing, *and/or* synthesizing evidence and/or information and making defensible inferences.** For example, in a social studies lesson, student groups are provided with key geographical, economical, and historical information about several major cities from around the globe. Groups are asked to compare and contrast the information and make inferences about the major factors that contribute to the establishment and growth of major metropolitan areas. Student groups then share and defend their in whole classroom presentations.	**A substantial number of students (around 60%) are actively engaged with gathering, classifying, comparing and contrasting, analyzing, *and/or* synthesizing evidence and/or information and making defensible inferences.** For example, in a geometry lesson, students take measurements of the surface area, circumference, radius, and diameter of several everyday life objects with circular cross-sections (plates, cans, garbage bins, etc.). Under the guidance of the teacher, students then work within groups to find relationships between the measures of every object and are challenged to come up with relationships that could be generalized across all objects.	**A large majority of students (more than 75%) are actively engaged with gathering, classifying, comparing and contrasting analyzing, *and/or* synthesizing evidence and/or information and making defensible inferences.** For example, in an English lesson, students read several articles about poetry and the ways in which the form and content of poems have changed during the 19th and 20th centuries. Students then analyze each article and synthesize the derived elements to come to conclusions about the attributes that make different kinds of poetry appealing to different audiences in different social and cultural contexts.	

18. Students ask Critical Questions or Make Critical Comments Regarding Information, Ideas, and Assumptions Discussed in Textbooks or Class

1	2	3	4	5	Rate
No students ask critical questions or make critical comments regarding information, ideas, *and/or* assumptions discussed in textbooks or class.	**Only a few students (5% or less) ask critical questions or make critical comments regarding information, ideas, *and/or* assumptions discussed in textbooks or class.**	**Some students (6 to 20%) ask critical questions or make critical comments regarding information, ideas, *and/or* assumptions discussed in textbooks or class.**	**A substantial number of students (21 to 50%) ask critical questions or make critical comments regarding information, ideas, *and/or* assumptions discussed in textbooks or class.**	**A large majority of students (more than 50%) ask critical questions or make critical comments regarding information, ideas, *and/or* assumptions discussed in textbooks or class.**	
Critical comments or questions are usually made in the context of learning environments that engage students with gathering, analyzing, and synthesizing information or evidence; communicating and defending inferences and conclusions; debating ideas; etc. Thus, in traditional teacher-centered approaches to instruction, students rarely ask critical questions or make critical comments. At best, student questions are limited to clarifying teacher directions or the content of the facts, principles, etc., that are targeted in the lesson.	Critical questions can take several forms. Some of these include: "Why is this conclusion important? How do we know? What is the evidence supporting this inference? What are the assumptions underlying this conclusion?" Etc. Critical statements are usually made in response to these and similar questions. For example, students exhibit the ability to engage in critical discourse when they are able to: Defend their conclusions based on the data they collected; identify assumptions that undermine a certain inference; point out a variable that was not taken into account in an experiment; link components of a few arguments to come to a new conclusion, etc.	For example, consider the scenario in #17(2) above: Student groups present inferences about the role of water, light, etc., in photosynthesis. During such presentations, other students ask critical questions of presenters about the validity of their data, logic, and/or inferences. A student might question a group's claim as to the role of the "nutrients" found in the soil in photosynthesis because in one set-up a bean plant grew in a pad of cotton where no soil was used. Another student might question the way that the presenters used to block sunlight from reaching one of their set-ups, thus questioning the validity of their inference in this regard, etc.	For example, consider the scenario in #17(3) above: Upon examining textual information about the target cities, students might make critical comments or raise critical questions. For instance, students might: Question the validity of some information based on comparing the information with things the students know from other sources (pointing out inconsistencies among sources); comment that the information is not sufficient for making valid conclusions because the examples chosen are not comprehensive (students might note that a major city they know about is not located next to a major river, and thus claim that the information presented is selective and will lead to partially valid inferences); etc.	Critical questions or comments can be varied in terms of articulation (some significant student insights can be stated in a few words or sentences) and the contexts within which they are made (while discussing a concept, making a presentation, answering a teacher or other student questions, conducting an experiment, building a model, solving a problem, etc.). Observers need to listen carefully to what students say in various classroom contexts and keep track of critical questions and comments (e.g., through a simple tally) throughout an observation session.	

19. Students Define Problems and Come up with Questions for Further Investigation

1	2	3	4	5	Rate
No students define problems *and/or* come up with questions that lend themselves to further investigation. In traditional learning environments, students mostly deal with well-defined, academic, teacher-initiated or end-of-chapter type problems and questions. Students have almost no input into these problems and questions, which mostly require the direct application of knowledge and principles from a single discipline. Thus, in this context, students rarely, if ever, engage the skills of defining problems or formulating questions that lend themselves to further investigation. (This skill remains one of the most difficult areas for students engaged with problem-solving.)	**Only a few students (5% or less) define problems *and/or* come up with questions that lend themselves to further investigation.** For example, toward the end of a science unit on the phases of matter the teacher and/or students identify a general problem or question. One such problem could relate to the amount of energy needed to move a locomotive using a steam engine. Before beginning to think about approaches to solve this problem, the problem itself needs to be defined. The definition should de-limit the problem such that students can solve the problem given their knowledge and skills. For instance, students need to ask about or set the weight of the locomotive, the water capacity of the engine, the elevation of the tracks relative to sea level (which affects the boiling temperature of water), etc. Students should also make some assumptions, such as ignoring resistance due to friction, etc. Finally, students need to rephrase the problem in the form of a specific question, such as "What is the amount of energy in Kcal needed to move a 5-ton locomotive with a 1000 Liters of water engine capacity a distance of 1 Km on rails located at sea level while ignoring resistance due to friction.	**Some students (6 to 20%) define problems *and/or* come up with questions that lend themselves to further investigation.** In a social studies unit on population growth, the teacher outlines a general problem, such as, "What are the most important factors that affect population growth in Egypt?" Being broad, students are asked to come up with a number of specific questions that relate to this general problem. As they formulate these questions, students think about ways to make their questions specific so that they are manageable and answerable given the available resources (time, access to information, students' ability to plot and interpret graphs, etc.). Students ask specific questions that lend themselves to further investigation, such as, "What is the relationship between the educational level of parents and the average number of children per family in a rural governorate, such as Minia?" and "Do families in rural, agriculture-based communities tend to have more children on the average than families in urban, industry and service-based communities in Egypt?"	**A substantial number of students (21 to 50%) define problems *and/or* come up with questions that lend themselves to further investigation.** In an Arabic unit on the types of plots that could be used to construct stories, the teacher elicits student ideas about several themes that they would like to write short stories about (freedom, travel, honesty, the Nile, etc.). Students then construct and define a central problem for the story and construct a set of interrelated questions that help them to identify some central issue, the main character(s) of their story, and the ways in which the characters interact with the central issue (e.g., a moral dilemma, a mystery, a dialogue about a controversial issue). These questions would guide student reasoning as they sequence and write their stories.	**A large majority of students (more than 50%) define problems *and/or* come up with questions that lend themselves to further investigation.** The examples provided here indicate that student engagement with defining problems will not necessarily be a regular aspect of classroom discourse and interactions. Students usually need to spend some time learning relevant content and mastering some skills before being able to engage with authentic problem solving that require defining problems and asking specific questions for investigation. Thus, a systematic approach should be used to have the teachers identify sessions where they *believe* students will be engaged with such activities. *Individuals coordinating the baseline study can then* ***randomly*** *pick* a few of these sessions to conduct classroom observations.	

20. Students Provide Alternative Approaches to Solving Similar Problems

1	2	3	4	5	Rate
No students provide alternative approaches to solving similar problems. In traditional learning environments, students are usually directed to solve problems using prescribed algorithms or procedures as dictated by teachers and/or textbooks. Being of the academic, textbook type, a problem in traditional learning environments does lend itself to a single prescribed problem-solving approach. Even if alternative approaches are available to solving the same problem, students are not encouraged to pursue such alternatives. Rather, single, "tried-and-proven" methods are encouraged and rewarded. What is more, in the absence of authentic, everyday life problems, alternative approaches to solving the same or similar problems are rarely encouraged and nurtured.	**Only a few students (5% or less) provide alternative approaches to solving similar problems.** In principle, both academic and authentic (e.g., everyday life) problems lend themselves to multiple problem-solving approaches. However, authentic, everyday life problems lend themselves more readily to alternative problem solving approaches because these problems usually require students to define the problem, choose factors or variables to investigate, and make some assumptions to make solving the problem a manageable task. By comparison, prescribed problem solutions (e.g., balancing a chemical equation, solving a second degree mathematical equation, computing the mortality rate for a population) are usually essential components of the pedagogical approach to teaching a certain disciplinary content areas (e.g., chemistry, algebra, geography). Thus, it is *not* fair to judge students as not coming up with multiple approaches to solve problems in traditional learning environments that stress disciplinary content and associated problem-solving procedures.	**Some students (6 to 20%) provide alternative approaches to solving similar problems.** For example, in a science project groups of students set out to estimate the number of plant species in their village or locale. Solving such a problem requires learning about several concepts (e.g., a species, dichotomous keys, mathematical estimation) and mastering several skills (e.g., observing, recording data, using a dichotomous key, designing a sampling plan). However, there are several approaches to attacking the problem. Student groups could come up with different ways to go about solving the problem and coming up with a defensible estimate. These alternative approaches depend on a number of factors including ways in which student groups go about sampling the areas in which they will conduct their observations and the mathematical formulas they end up using to come up with their final estimates.	**A substantial number of students (21 to 50%) provide alternative approaches to solving similar problems.** For example, in mathematics, students are asked to estimate the area of an irregular plane (which could represent a piece of land where farmers are interested in getting an accurate estimate of the surface area of the land for purposes of planting the land). This is a relatively simple problem: A general heuristic for solving such a problem would be to section the irregular shape into a number of regular geometrical shapes, compute the surface areas of these shapes, and then add up the individual areas to come up with an estimated area for the whole irregular shape. However, there is a large number of specific ways in which students can go about solving this problem. Different students may choose to section their irregular shape in a number of ways and go about finding an answer accordingly. Students should be encouraged to pursue as many as different approaches as possible without imposing a single "best" way on them. Note that this is a simple problem because despite the fact that there are a number of ways to get to an answer, a reasonably objective, and accurate answer can be attained.	**A large majority of students (more than 50%) provide alternative approaches to solving similar problems.** It is important to note that some authentic problems do not necessarily have "an answer." Rather, solutions or answers to these problems are judged in terms of comparing the associated benefits and burdens. For example, in an integrated unit, student groups are assigned the problem of finding the best way to handle garbage disposal in Alexandria. Alternative approaches to solving this problem (incineration, landfills, partial recycling, etc.) bear different benefits (less pollution, saving energy, reducing environmental impacts, etc.) and burdens (high cost, long term hazardous impacts, depriving some groups from a source of income, etc.). Thus, different student groups can come up with different approaches to solve this problem each of which bears certain benefits and burdens. Student solutions cannot be compared in reference to a "right" way to solve the problem. Student solutions should be judged in terms of the validity of the reasoning processes involved in coming up with and defending their solutions: Process is more important than the product.	

21. **Students Assess the Effectiveness of Alternative Approaches to Solving a Problem and Defend the Most Effective Approach**

1	2	3	4	5	Rate
No students are actively engaged with assessing the effectiveness of alternative approaches to solving a problem and/or defending the most effective approach. In traditional learning environments, students are expected to solve academic, textbook type problems using prescribed procedures or algorithms. What is more, students are rarely, if ever, given the opportunity to evaluate their solutions. Rather, it is the teacher who judges the adequacy and validity of these solutions with reference to what is considered the "best way" to solve the problem at hand. Thus, in traditional learning environments, students are rarely, if ever, engaged in assessing the effectiveness of alternative ways to solve the same or similar problems.	**Only a few students (5% or less) are actively engaged with assessing the effectiveness of alternative approaches to solving a problem and/or defending the most effective approach.** In the context of solving problems that lend themselves to multiple solutions [see #20 (3), (4), and (5) above], students are likely to come up with different approaches to attack a problem. However, some of these approaches might not be valid or some approaches might be more effective (more accurate, more economic, make less assumptions, etc.) than others. A crucial problem-solving skill for students to master is the ability to assess whether an approach to solving a problem is valid, and how one approach to solving a problem compares to others. Students should be able to compare and contrast the different approaches; decide that one or a few approaches are relatively better than others; and defend their choices using reasonable arguments.	**Some students (6 to 20%) are actively engaged with assessing the effectiveness of alternative approaches to solving a problem and/or defending the most effective approach.** Consider #20 (3) above: Some student groups might overlook to sample random areas for observation in the locale being studied; others might choose a limited number of areas even though these were randomly sampled. Still other groups might not use a systematic approach to going about identifying and recording the different plant species in the sample areas. These different factors might result in solutions with differential accuracy and effectiveness. After presenting their results to the whole class, student groups compare and contrast the different approaches to answering the question at hand and make judgments about validity of the different approaches. For example, students could decide that random sampling might not be the best approach because vegetation and its variety in the target village are closely related to the availability of close-by water sources. Thus, they might decide that a combination of purposeful and random sampling might be the best approach to solve this problem.	**A substantial number of students (21 to 50%) are actively engaged with assessing the effectiveness of alternative approaches to solving a problem and/or defending the most effective approach.** Consider #20 (4) above: Virtually any way students decide to section their irregular shape will eventually allow them to reach a reasonably accurate answer. However, some approaches to sectioning the irregular shape will surely be more economic and effective than others. In general, the smaller the number of regular shapes that students use to capture the irregular shape, the faster it will be to compute the total area because students will have a smaller number of individual shapes whose areas need to be computed. Thus, in this case, some approaches will *clearly* be more effective than others. Students compare and contrast the different approaches and come up with a choice they are able to defend.	**A large majority of students (more than 50%) are actively engaged with assessing the effectiveness of alternative approaches to solving a problem and/or defending the most effective approach.** In some cases it is very hard to make judgments as to the relative effectiveness of different problem solutions because values might come into play [unlike the case of #21 (4)]. Consider #20 (5): In this case, different solutions to the garbage disposal problem will be associated with different benefits and burdens. These benefits and burdens, however, are not necessarily comparable. For example, while one solution might be more aesthetically pleasing and encourages tourism, it might deprive a large number of people from a source of income having been involved in small-scale recycling of garbage. Another solution would result in an eye soar (e.g., a landfill) but will save the city a lot of money that could be used to fund other social services. Thus, when comparing different solutions to this problem, students will find that different values (economic, aesthetic, environmental, etc.) are competing. Here, student engagement with identifying the different players involved and articulating their competing values comprises a set of skills that is worthwhile mastering for their own sake as a crucial aspect of problem solving.	

SCOPE +

22. Students Utilize Technology in Ways that Help Them to Manipulate Knowledge, Explore, and Practice

1	2	3	4	5	Rate
No or few students are actively engaged in technology supported activities to manipulate and explore knowledge, and experience hands-on practice None or few of the students are focused on the technology supported learning activities , They are doing things that are unrelated to the learning tasks and none of them, (a) view demonstrations of information created by technology; (b) manipulate information in new and interactive ways, (c) apply concepts and skills through individual or group activity work set up by the technology. Less than 25% of students have the opportunity to participate in a technology empowered individual, group, or class activity for at least 5 minutes over a 3 hour period, on average	**Students are actively engaged in technology supported activities when they view technology powered demonstrations, but the presentations or activities do not set up opportunities for students to manipulate and explore knowledge, and experience hands-on practice** Students participate in technology supported learning activities, They (a) view demonstrations of information created by technology, but do NOT (b) manipulate information in new and interactive ways, (c) apply concepts and skills through individual or group activity work set up by the technology. At least 25% of students have the opportunity to participate in a technology empowered individual, group, or class activity for at least 5 minutes over a 3 hour period, on average.	**Some students are actively engaged in technology supported activities when they either view technology powered demonstrations, manipulate and explore knowledge, and/or experience hands-on practice** Students participate in technology supported learning activities, They do two or more of the following (a) view demonstrations of information created by technology, (b) manipulate information in new and interactive ways, (c) apply concepts and skills through individual or group activity work set up by the technology. At least 33% of students have the opportunity to participate in a technology empowered individual, group, or class activity for at least 10 minutes over a 3 hour period, on average.	**Many students are actively engaged in technology supported activities when they view technology powered demonstrations, manipulate and explore knowledge, and experience hands-on practice** Students participate in technology supported learning activities, They do two or more of the following (a) view demonstrations of information created by technology, (b) manipulate information in new and interactive ways, (c) apply concepts and skills through individual or group activity work set up by the technology. At least 50% of students have the opportunity to participate in a technology empowered individual, group, or class activity for at least 10 minutes over a 3 hour period, on average.	**Most students are actively engaged in technology supported activities when they view technology powered demonstrations, manipulate and explore knowledge, and experience hands-on practice** Students participate in technology supported learning activities, They do two or more of the following (a) view demonstrations of information created by technology, (b) manipulate information in new and interactive ways, (c) apply concepts and skills through individual or group activity work set up by the technology. At least 75% of students have the opportunity to participate in a technology empowered individual, group, or class activity for at least 10 minutes over a 3 hour period, on average.	

SCOPE +

We modified the rubric for the lowest rating from no students to include a few students to cover the possibility of only 1 or 2 students engaged in technology

We have the same comment regarding the 3 hour period. We need to change it to make it easier for observers to deal with.

SCOPE +

Domain 2: The Learner

Standard 1: The Student Acquires Basic Subject Matter Competencies in Science and Arts

7. The Learner Masters the Basic of Information Technology and Communication

Domain 7: Information and Communication Technology

Standard 3: Employing Information and Communication Technology (ICT) in Teaching and Learning Process

1. ICT Systems are used in Evaluation and Education
2. ICT Systems are used in Problem Solving and Supporting Critical Thinking
3. ICT Systems are used in Communicating with International Knowledge Sources