

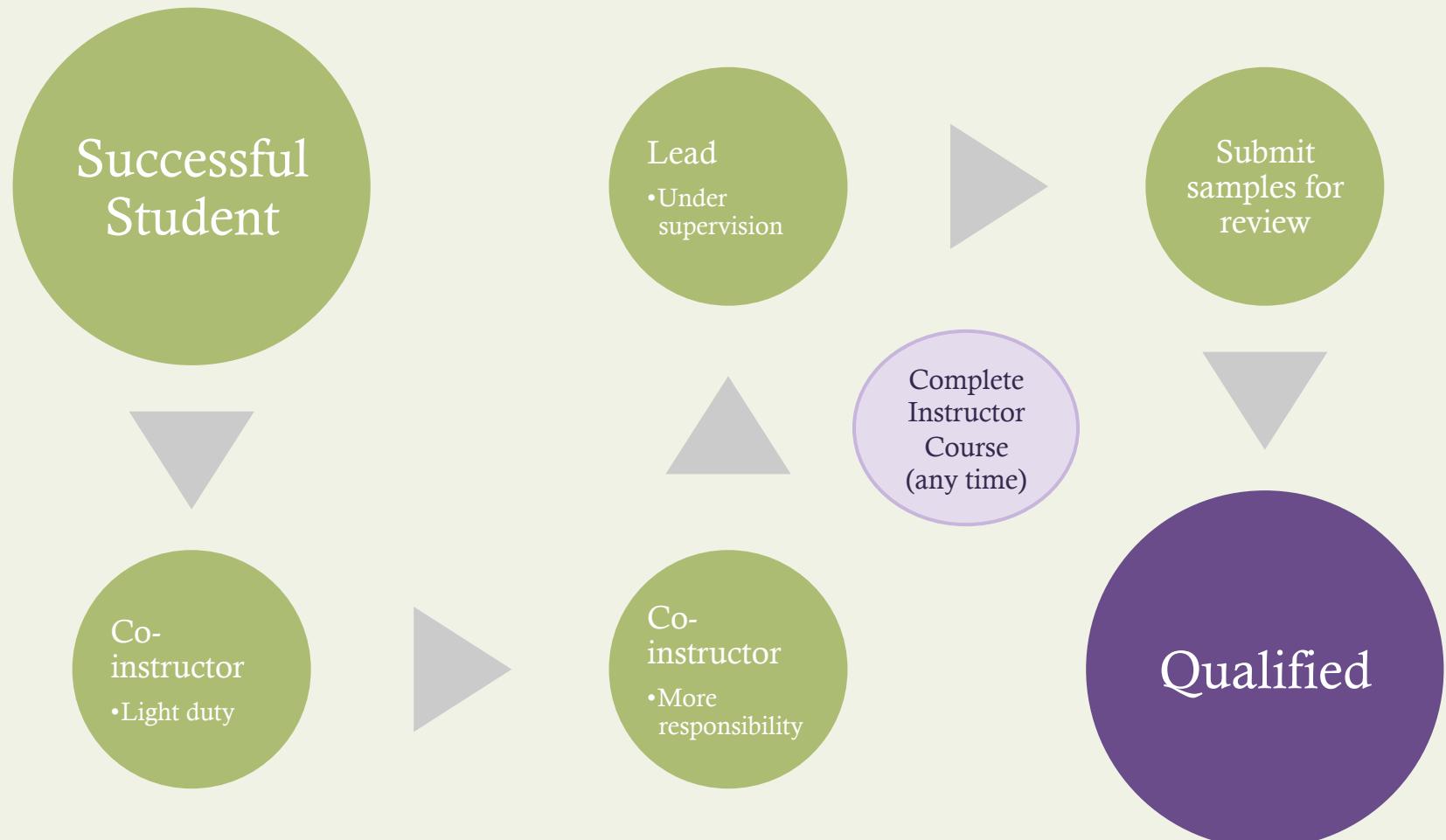
Online! AST Instructors' Training Course

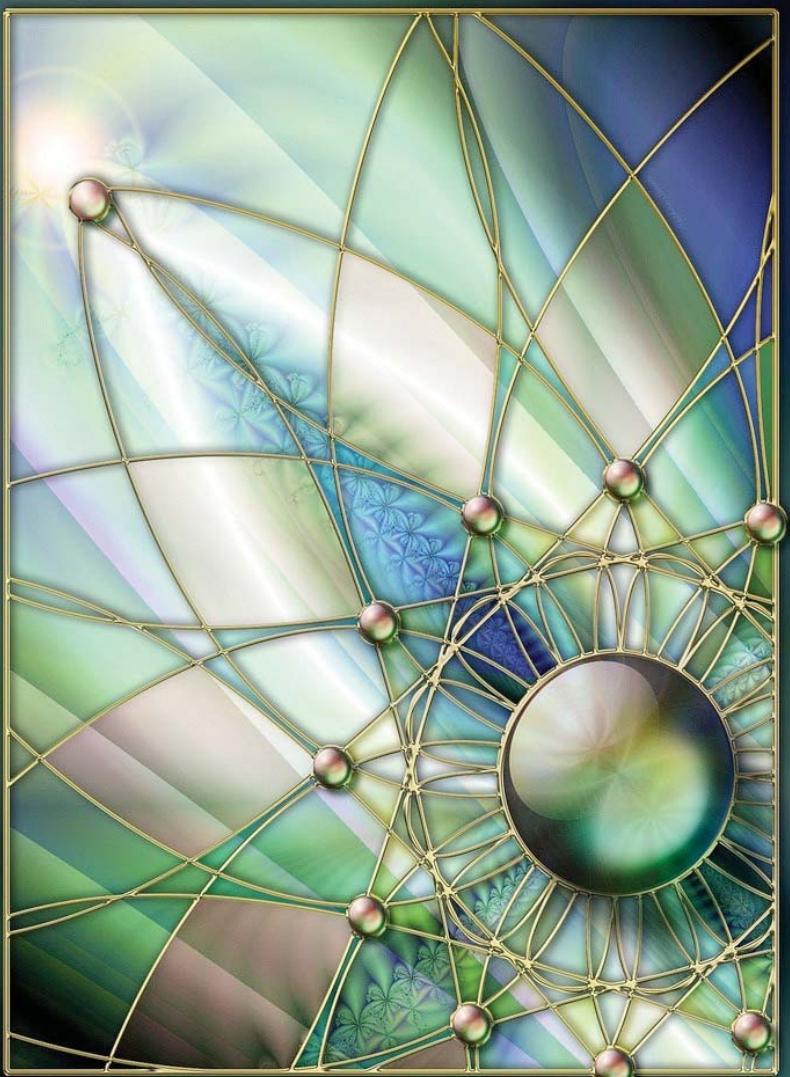
Introduction to the AST Instructor Apprentice Model

Rebecca Fiedler
Acclaro Research Solutions

Cem Kaner
Florida Institute of Technology

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Online! Instructors' Training Course

BBST Overview

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Acknowledgements

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The authors would also like to acknowledge the collaboration Scott Barber and Doug Hoffman in the development of the instructor course materials, and the encouragement and support of Dr. William Shoaff, Department Chair at Florida Tech and Michael Kelly, former President of the Association for Software Testing.

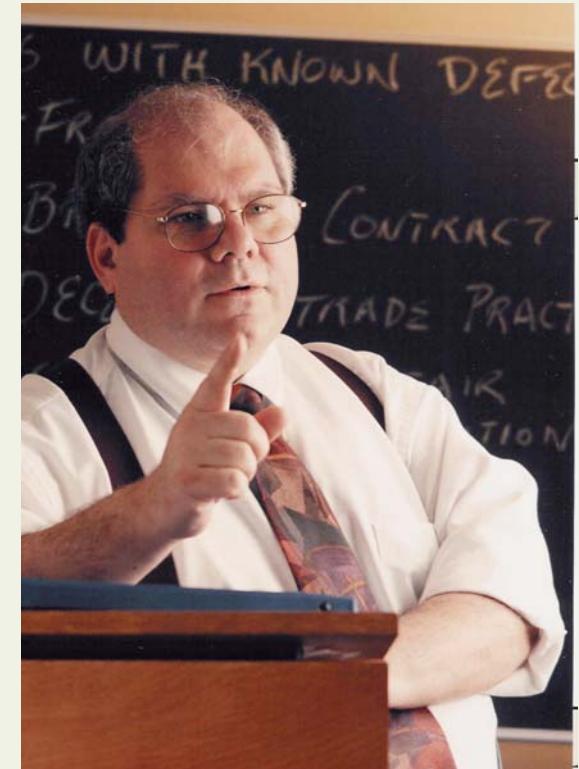
About Rebecca L. Fiedler www.beckyfiedler.com

- ❖ I've been teaching students of all ages – from Kindergarten to University – for the past 25 years. My primary interests are how people learn and how technology can make educational efforts more effective and more accessible to more people.
- ❖ Until recently, I served as an Assistant Professor of Education at Indiana State University and St. Mary-of-the-Woods College, but to really get to the roots of effective design of online education, especially for working professionals, it made more sense for me to go independent and focus my own time as an independent consultant. I consult primarily through Acclaro Research Solutions at www.acclaroresearch.com.
- ❖ Cem Kaner and I are co-Principal Investigators on the National Science Foundation grant that subsidizes development of these courses.
- ❖ My Ph.D. (University of Central Florida) concentrations were in Instructional Technology and Curriculum. My dissertation research applied qualitative research methods to the use of electronic portfolios. I also hold an M.B.A. in Management and a Bachelor of Music (Education).



About Cem Kaner www.kaner.com

- ❖ My job titles are Professor of Software Engineering at the Florida Institute of Technology, and Research Fellow at Satisfice, Inc. I'm also an attorney, whose work focuses on same theme as the rest of my career: satisfaction and safety of software customers and workers.
- ❖ I've worked as a programmer, tester, writer, teacher, user interface designer, software salesperson, organization development consultant, as a manager of software testing, user documentation, and software development, and as an attorney focusing on the law of software quality. These have provided many insights into relationships between computers, software, developers, and customers.
- ❖ I studied Experimental Psychology for my Ph.D., with a dissertation on Psychophysics (essentially perceptual measurement). This field nurtured my interest in human factors (usability of computer systems) and the development of useful, valid software metrics.
- ❖ I recently received ACM's Special Interest Group on Computers and Society "Making a Difference" award, which is "presented to an individual who is widely recognized for work related to the interaction of computers and society. The recipient is a leader in promoting awareness of ethical and social issues in computing."
- ❖ <http://www.sigcas.org/awards-1/awards-winners/sigcas-making-a-difference-award-2009>



Many thanks...

- ❖ The BBST lectures evolved out of courses co-authored by Kaner & Hung Quoc Nguyen and by Kaner & Doug Hoffman (now President of the Association for Software Testing), which we merged with James Bach's and Michael Bolton's Rapid Software Testing (RST) courses. The online adaptation of BBST was designed primarily by Rebecca L. Fiedler.
- ❖ After being developed by practitioners, the course evolved through academic teaching and research largely funded by the National Science Foundation. The Association for Software Testing served (and serves) as our learning lab for practitioner courses. We evolved the 4-week structure with AST and have offered over 30 courses to AST students. We could not have created this series without AST's collaboration.
- ❖ We also thank Jon Bach, Scott Barber, Ajay Bhagwat, John McConda, dozens of participants in the Workshops on Teaching Software Testing, members of AST's Education SIG, and students in approximately 30 AST courses for critically reviewing materials from the perspective of experienced practitioners. We also thank the many students and co-instructors at Florida Tech, who helped us evolve the academic versions of this course, especially Pushpa Bhallamudi, Walter P. Bond, Tim Coulter, Sabrina Fay, Ajay Jha, Alan Jorgenson, Kishore Kattamuri, Pat McGee, Sowmya Padmanabhan, Andy Tinkham, and Giri Vijayaraghavan.

Course Objectives:

- ❖ Understand the philosophies of teaching and testing underlying the BBST project.
- ❖ Become familiar with the online course model used in BBST courses.
- ❖ Understand the instructor's role in online teaching including:
 - ❖ the logistics of an online course
 - ❖ course management and communication.
 - ❖ feedback, assessment, and grading to improve student learning.

BBST Project Goals

- ❖ To develop and sustain a cadre of academic, in-house, and commercial instructors
- ❖ To offer and evaluate the course at collaborating research sites (including both universities and businesses).

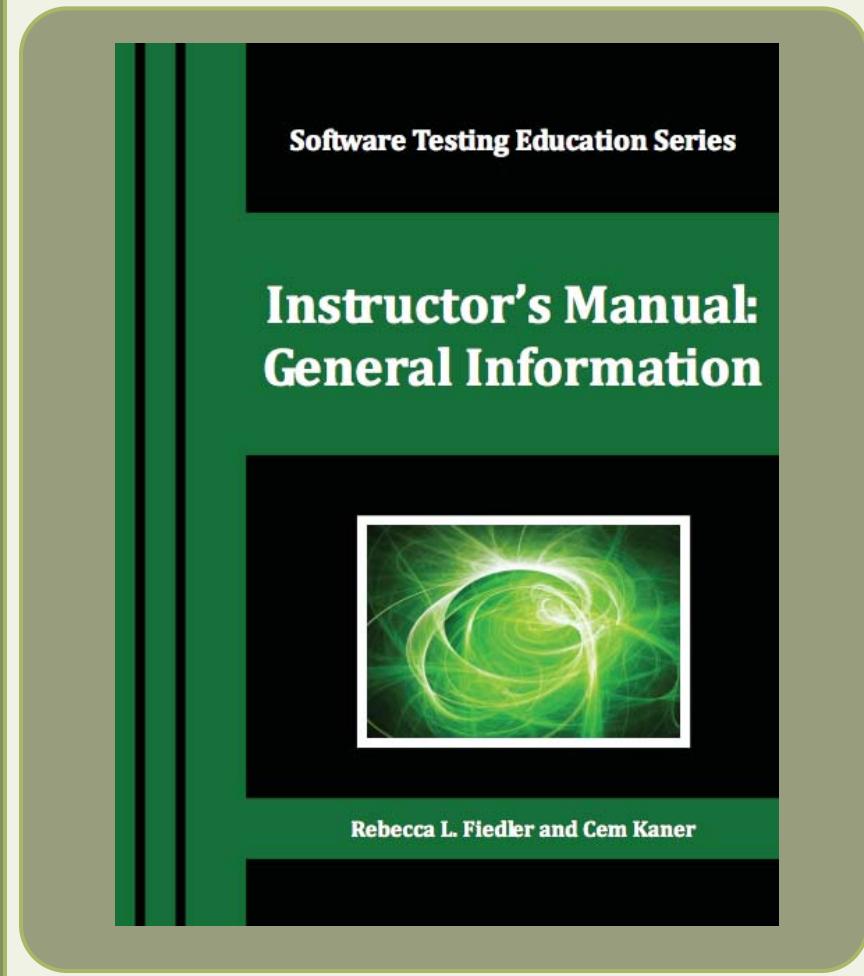
Audience for This Course

- ❖ Graduates of at least one BBST course
- ❖ University instructors (both experienced and inexperienced);
- ❖ Commercial trainers offering open enrollment and private courses;
- ❖ In-house trainers; and
- ❖ Professional association instructors.

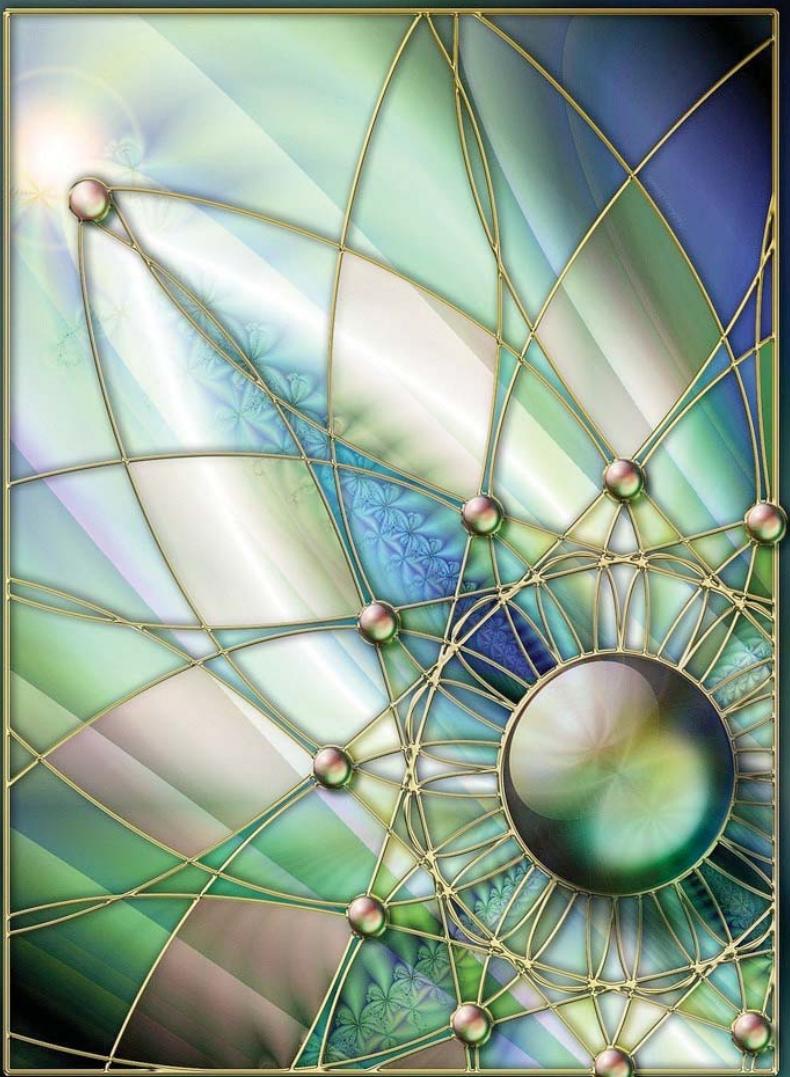
Becoming a Software Testing Instructor

- ❖ University instructors (both experienced and inexperienced);
- ❖ Commercial trainers offering open enrollment and private courses;
- ❖ In-house trainers; and
- ❖ Professional association instructors.

Instructor Resources



- ❖ Instructor Manuals
- ❖ BBSTInstructors.org
 - ❖ Instructor forums
 - ❖ Fieldstones project
- ❖ Supervisors at your institution



Online! Instructors' Training Course

Testing and Teaching Philosophies

Rebecca Fiedler
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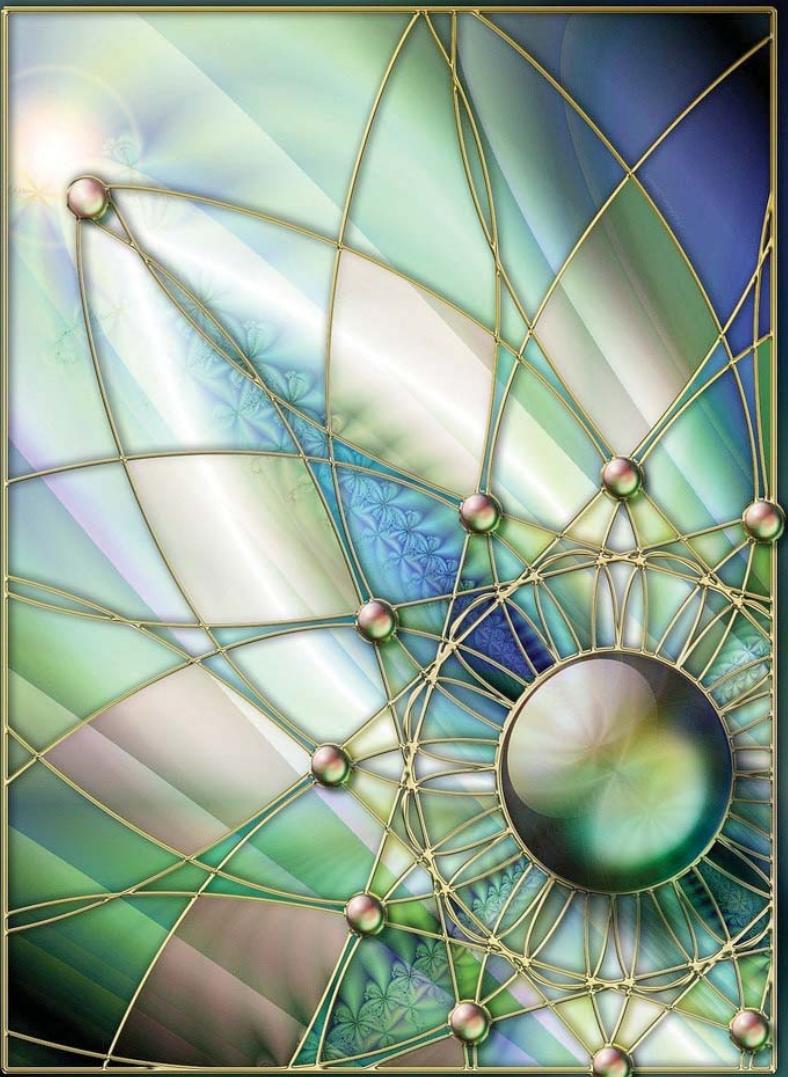
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The Evolution of BBST

- ❖ The critical need for software testers is not being met through traditional academic education
- ❖ Short-term commercial courses by charismatic practitioners offer too little opportunity for students to develop testing skills
- ❖ The BBST online courses evolved from the commercial tradition but are modified to give students time to learn and apply new skills
- ❖ Can be used in online, face-to-face, for academic credit, certificate credit, and non-credit settings.

The Evolution of BBST

1. Strong content
2. Story-based teaching
3. Detailed examples
4. Video lectures
5. In-class activities that tie to the lecture
6. Application to a real product under test
7. Orientation exercises
8. Open-book quizzes
9. Study-guide based exam
10. Challenging but focused assignments
11. Task scaffolding
12. Peer review
13. Explicit discussions of learning issues in the course design
14. Open discussion of the employment value of the material and the work
15. Enthusiasm and ongoing renewal of the course
16. Instruction on test-taking skills
17. Extensive student feedback via the course evaluation instrument



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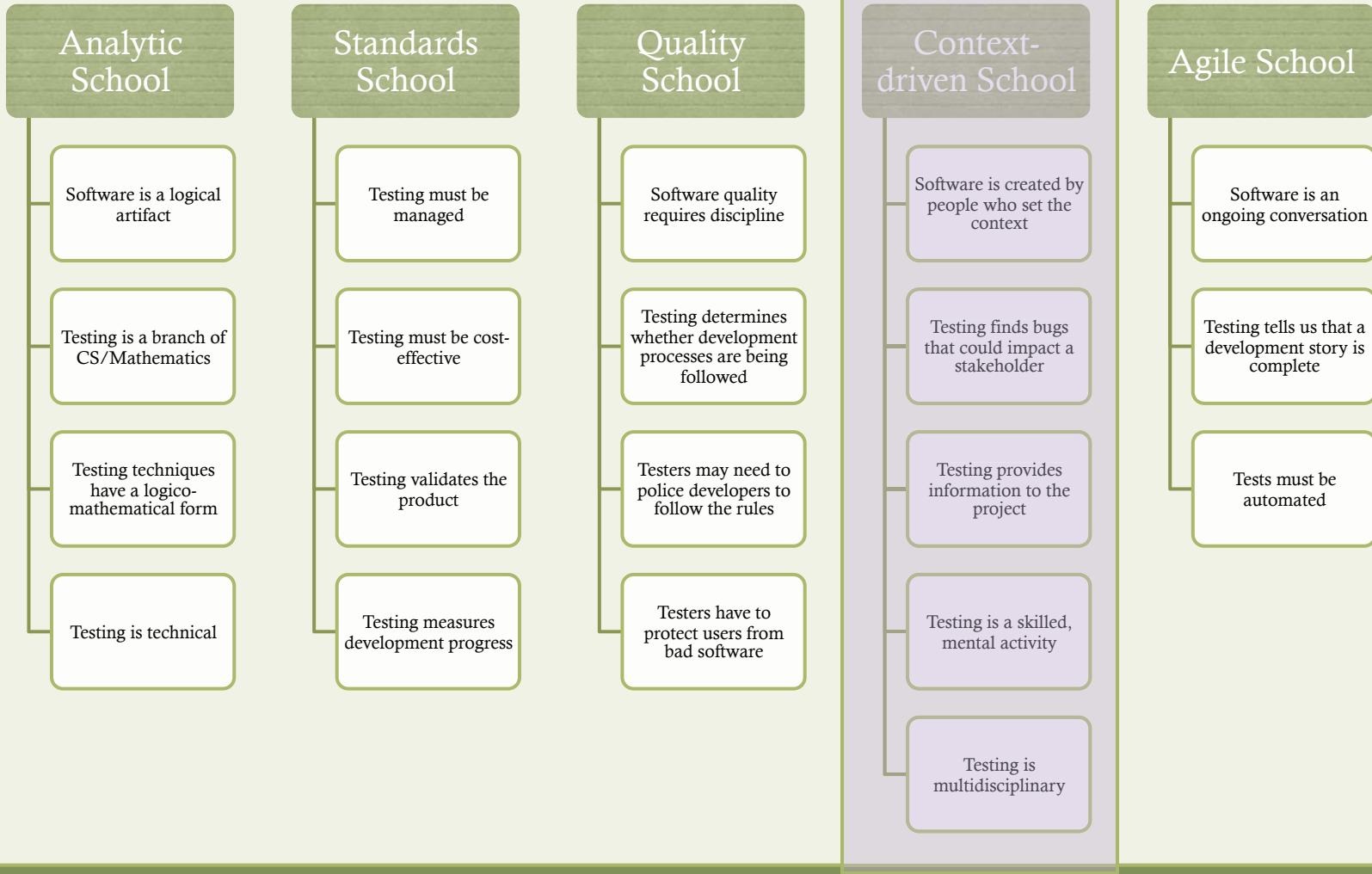
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Our Testing Philosophy



Ways Context Varies

1. The goals and quality criteria for the project
2. What skills and resources are available to the project
3. What is in the product
4. How the product could fail
5. The consequences of potential failures
6. Who might care about which consequence of what failure
7. How to trigger a fault that generates the failure we're seeking
8. How to recognize failure
9. How to decide what result variables to pay attention to
10. How to decide what other result variables to pay attention to in the event of intermittent failure
11. How to troubleshoot and simplify a failure , so as to better:
 8. Motivate a stakeholder who might advocate for a fix
 9. Enable a fixer to identify and stomp the bug more quickly
12. How to expose, and who to expose to, undelivered benefits, unsatisfied implications, traps, and missed opportunities.

Theory in BBST

- ❖ Adult learning theory from Malcolm Knowles
 - ❖ Adults are self-directed
 - ❖ Adult students bring life experience to the classroom
 - ❖ Adults students demand education that is relevant to their real-world experiences.
- ❖ Constructivism (numerous proponents)
- ❖ Activating prior knowledge influences a student's ability to learn new information or skills
- ❖ Bloom's Taxonomy of Learning Objectives

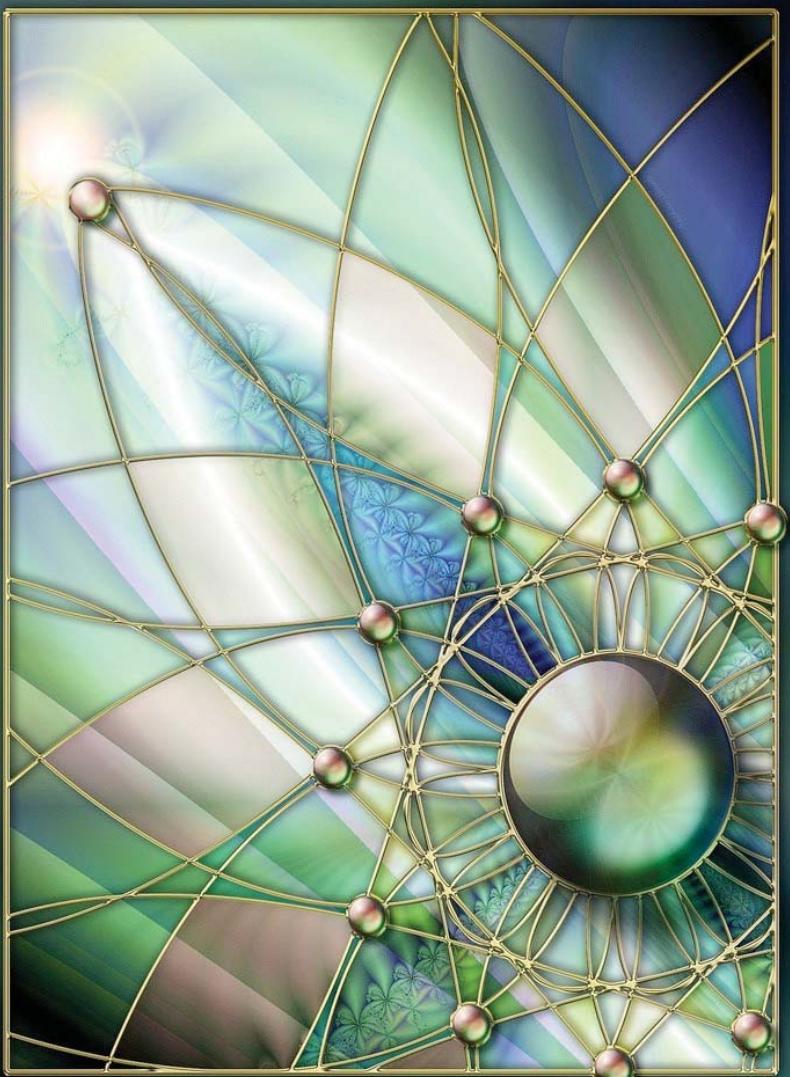
Knowledge

Kaner & Bach

Extension

- ❖ Facts
- ❖ Concepts
- ❖ Procedures
- ❖ Cognitive strategies
- ❖ Models
- ❖ Skills
- ❖ Attitudes
- ❖ Metacognition

- ❖ Remember
- ❖ Understand
- ❖ Apply
- ❖ Analyze
- ❖ Evaluate
- ❖ Create



Online! Instructors' Training Course

BBST Course Model

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BBST Online Course Model

| | Week 1 | Week 2 | Week 3 | Week 4 | Post-course |
|-----------------|--|------------------------------|---------------|----------------|---|
| Formal delivery | <p>Multiple iterations</p> <pre> graph TD A[Optional preparatory exercise] --> B[Video & Readings] B <--> C[Quiz] D[Reflection & interaction on exercise] <--> E[Reflection & interaction on quiz] E --> A </pre> | | | | Course evaluation (students and instructors) |
| Assignment | | Intro to group project | Group project | Study for exam | Take exam |
| Study groups | <p>Help!! Discussion Forum Quiz Discussion Forum Exam Cram Forum</p> | | | | |
| Social groups | Meet & Greet Forum | Hallway Hangout (Cyber Café) | | | |

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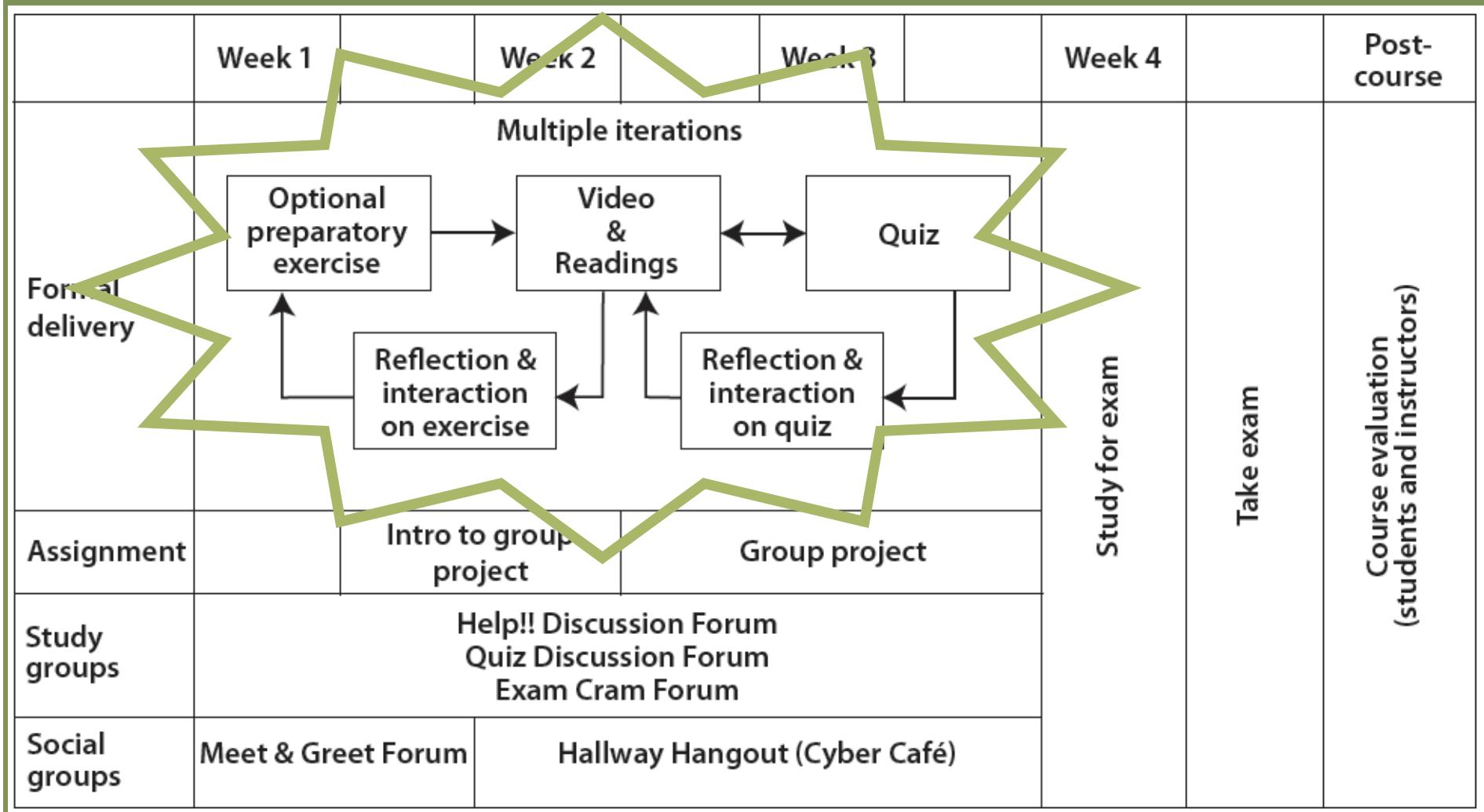
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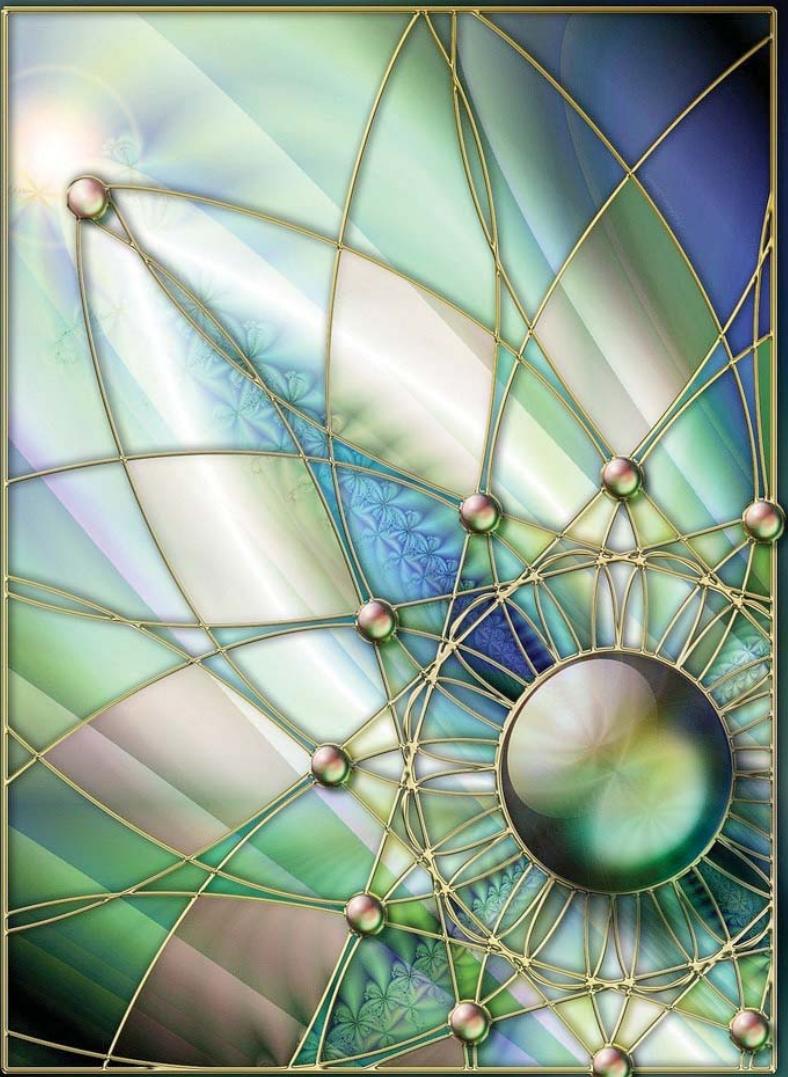
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BBST Online Course Model





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Instructor Responsibilities

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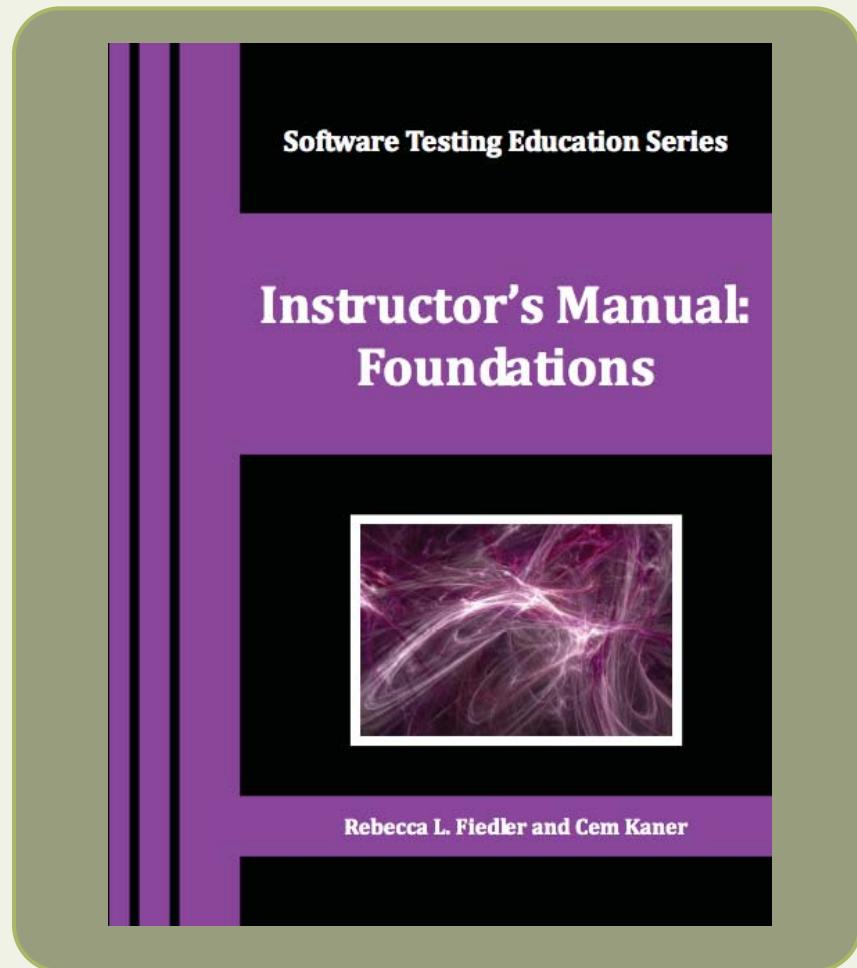
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Instructor's Manual



- ❖ Available for each course
- ❖ Introduces each class
- ❖ Tips to prepare for teaching it
- ❖ Chart of instructors' tasks for each week of course
- ❖ Detailed instructions for exercises & assignments

Instructor Responsibilities

- ❖ Managing the learning environment
 - ❖ Direction
 - ❖ Feedback
 - ❖ Encouragement
- ❖ Provide subject matter expertise
- ❖ Regular communication
 - ❖ Tone
 - ❖ Humor
- ❖ Pre-course set up
 - ❖ Checking course content
 - ❖ Updating task lists
 - ❖ Scheduling quiz closings
 - ❖ Sending welcome email
 - ❖ Getting policy agreements
- ❖ Wrapping up the course
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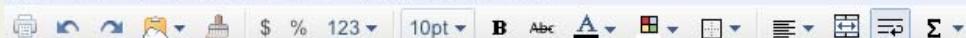
Pre-course Setup

- ❖ Create mailing list for co-instructors
- ❖ Divide instructor tasks
- ❖ Check course content and links
 - ❖ Discussion boards
 - ❖ Gradebook items
 - ❖ Quiz and quiz db dates and times
- ❖ Determine and post policies
- ❖ Update and post course task list
- ❖ Post instructor introductions
- ❖ Send welcome message

Weekly Workflow

| Task | | | | |
|---------------|--|--|--|--|
| Preparation | | | | |
| Description | | | | |
| Outcome | | | | |
| Tools | | | | |
| Core readings | | | | |
| Communication | | | | |

File Edit View Insert Format Form Tools Help



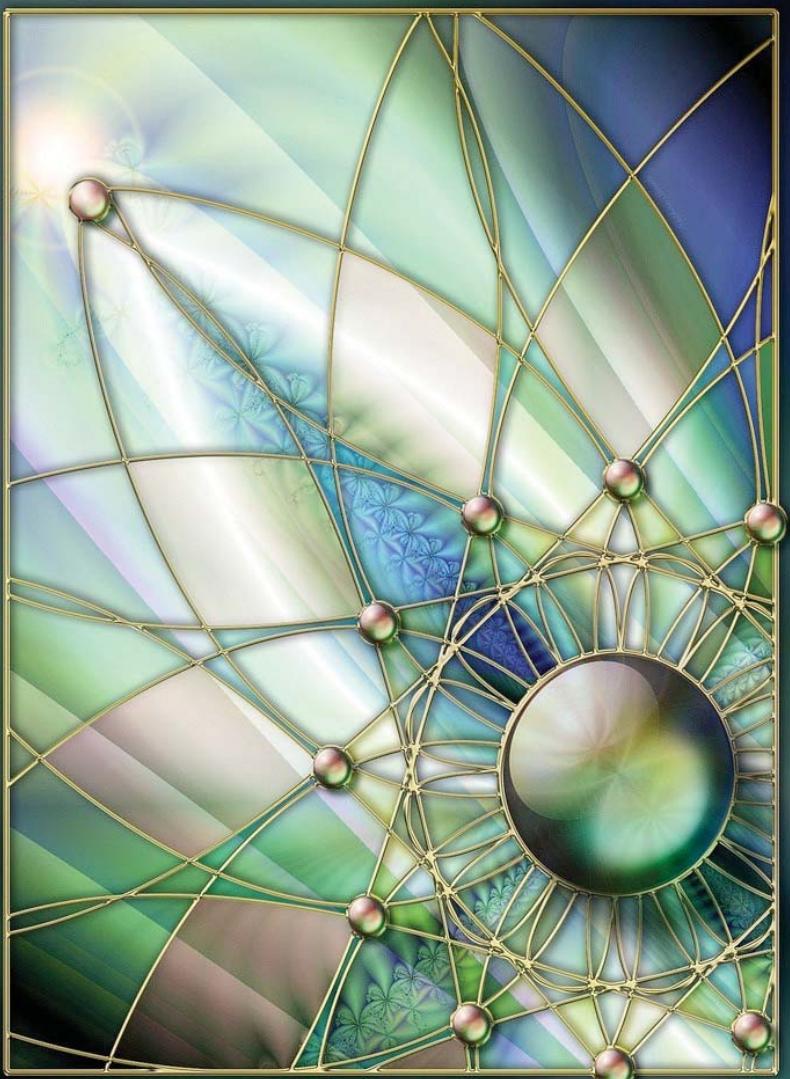
| | A | B | C | D | E | F | G | H |
|----|----------------|--------|---|--|---|---|-----|------------|
| 1 | | Start | Complete | Student tasks | Instructor tasks | Lead Instructor | You | Supervisor |
| 2 | | 15-Aug | Enter Official Day 1 of course in Cell B2 to populate all dates on this sheet | | | X | | |
| 3 | Week 0 | 30-Jul | 30-Jul | | Set up Yahoo Instructor Mailing list (or suitable substitution) | | | X |
| 4 | | 3-Aug | | | Agree to course policies | X | X | |
| 5 | | | | | Work through course sequence: lectures, orientation exercises and quizzes | X | X | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | 13-Aug | 13-Aug | Agree to course policies | policy reminder note | | | |
| 10 | | | 14-Aug | | post "What time is it" course announcement | | | |
| 11 | Official Day 1 | 15-Aug | | | | | | |
| 12 | Week 1- Part A | 14-Aug | 15-Aug | Introduce yourself to the class | introduce yourself to class | X | X | X |
| 13 | | 15-Aug | 16-Aug | Skim the Orientation to AST BBST courses | | | | |
| 14 | | 15-Aug | 17-Aug | Lecture 1 & quiz | ongoing meet & greet | X | X | |
| 15 | | | 17-Aug | | remove students who haven't agreed to policies | X | | |
| 16 | | | 18-Aug | 18-Aug | Deadline for all Week One - Part A Tasks | assign students into groups for oracle assignment | X | |
| 17 | | | 19-Aug | | | quiz 1: post answers (early AM) | X | |
| 18 | Week 1- Part B | 16-Aug | 19-Aug | Respond to Meet & Greet | | | | |
| 19 | | | 19-Aug | Orientation exercise 1 (oracles) | | | | |
| 20 | | | 19-Aug | 19-Aug | nag note for oracle assignment phase 1 (late PM) | X | | |
| 21 | | | 20-Aug | | quiz 1: final feedback (late PM) | X | | |
| 22 | | | 20-Aug | | Post re: philosophy of quizzes | | X | |
| 23 | | | 20-Aug | | orientation 1: acknowledgment | X | | |
| 24 | | | 20-Aug | 21-Aug | assign students to groups for mission assignment | X | | |
| 25 | | | 21-Aug | | review students who are not participating send notes | X | | |
| 26 | | | | 21-Aug | post comments on oracle assignment phase 1 | X | | |
| 27 | | | | 21-Aug | Preview next week, comment on instructional objectives of orientation exercises, value of study guide questions | | | X |
| 28 | | | 22-Aug | | quiz 2: post answers (early AM) | X | | |
| 29 | Week 2- Part A | 20-Aug | 22-Aug | Reflection on orientation exercise 1 (oracles) | review of week 1 | X | | |
| 30 | | | 22-Aug | Orientation exercise 2 (Impossibility) | week 1 review to instructors | | X | |

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Tracking Student Outcomes

- ❖ Use the 2nd sheet of the Google document
- ❖ Keep track throughout the class
- ❖ Final dispositions
 - ❖ Completed
 - ❖ NonComplete (Finished course but not ready to go on)
 - ❖ NoShow
 - ❖ Dropped (voluntarily)
 - ❖ Excused (Dropped by the instructor)
 - ❖ Barred (Incident prevents student from taking future classes)
 - ❖ Audited (Retook a class for some reason)



Online! AST Instructors' Training Course

Course Management

Rebecca Fiedler
Acclaro Research Solutions

Cem Kaner
Florida Institute of Technology

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Instructor Responsibilities

- ❖ Managing the learning environment
 - ❖ Direction
 - ❖ Feedback
 - ❖ Encouragement
- ❖ Provide subject matter expertise
- ❖ Regular communication
 - ❖ Tone
 - ❖ Humor
- ❖ Pre-course set up
 - ❖ Checking course content
 - ❖ Updating task lists
 - ❖ Scheduling quiz closings
 - ❖ Sending welcome email
 - ❖ Getting policy agreements
- ❖ Wrapping up the course
 - ❖ Establishing your presence
 - ❖ Welcome email
 - ❖ Post a bio
 - ❖ Participation

Managing the Online Classroom



Photo from Microsoft Gallery

- ❖ Keep the online classroom well-organized

Managing the Online Classroom

| Foundations 2.0 Task List | |
|---------------------------|--|
| When | What |
| 11/19 | Agree to course policies |
| 11/21 | Official Day 1 |
| Lesson 1 | |
| | Forum: Introduce yourself to the class |
| | Skim the AST BBST Orientation on the Start Here tab |
| | Lecture 1 & quiz |
| | Forum: Respond to Meet & Greet |
| 11/24 | Deadline for all Lesson 1 Tasks |
| Lesson 2 | |
| | Forum: Describe your role |
| | Lecture 2 & quiz |
| | Assignment: Skim the final exam study guide |
| | Required Reading: Kaner, Hendrickson & Brock's Managing the Proportion of Testers to (Other) Developers |
| | Assignment: Begin the Mission Assignment with group |
| | Optional: Participate in Quiz 1 Q&A discussion forum |
| | Optional Recommended Reading: Bach's Heuristic Test Strategy Model |
| | Optional Recommended Reading: Kaner's Recruiting Software Testers |
| 11/27 | Deadline for all Lesson 2 Tasks |
| Lesson 3 | |
| | Lecture 3 & quiz |
| | Assignment: Phase 1 of Using Oracle Heuristics with group |
| | Forum: Oracles Orientation (Testing a word processor) |
| | Assignment: Complete Mission Assignment with group |
| | Required Reading: Bach and Bolton's Testing Without a Map |
| | Optional: Participate in Quiz 2 Q&A discussion forum |
| | Optional Recommended Reading: Kelly's Using Heuristic Test Oracles |
| | Optional Recommended Reading: Koen's Engineering Method |
| | Optional Recommended Reading: Weyuker's On Testing Non-testable Programs |
| 12/1 | Deadline for all Lesson 3 Tasks |
| Lesson 4 | |
| | Lecture 4 & quiz |
| | Forum: The Impossibility of Complete Testing (Square Root Function) orienting exercise |
| | Assignment: Phase 2 of Using Oracle Heuristics with group |
| | Required Reading: Hoffman's Exhausting Your Test Options |
| | Required Reading: Kaner's Software Negligence and Testing Coverage |
| | Required Reading: Marick's How to Misuse Code Coverage |
| | Optional: Participate in Quiz 3 Q&A discussion forum |
| | Optional Recommended Reading: Goldberg's What every computer scientist should know... |
| | Optional Recommended Reading: Marick's Experience with the cost of different coverage goals for testing |
| | Optional Recommended Reading: Charles Petzold (1993) Code: the Hidden Language of Computer Hardware and Software. Microsoft Press. |
| 12/4 | Deadline for all Lesson 4 Tasks |

- ❖ Encourage students to use the assignment checklist – and you should be bound by it unless you share changes early.

BBST Course ▶ BA_Master

[Return to my normal role](#)**Activities**

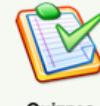
-  Checklists
-  Choices
-  Forums
-  Quizzes
-  Resources

People

-  Participants

Administration

-  Grades
-  Profile

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Your Instructors

Cem Kaner



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My Progress



Discussions



Quizzes

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Managing the Online Classroom



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- ❖ Consistency helps students know what to expect: routine communications helps manage expectations and consistent due dates helps students manage their work load.

Managing the Online Classroom



Photo from Microsoft Gallery

- ❖ Make as much material as possible available to students so they can manage their work load.

Managing the Online Classroom



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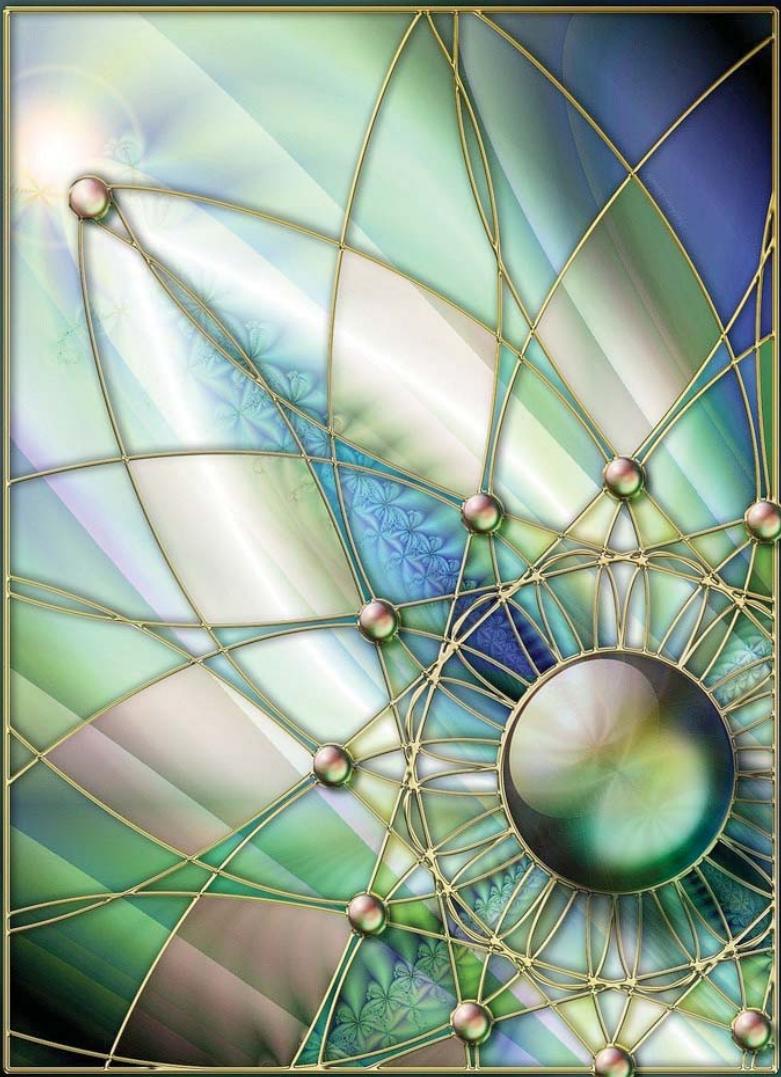
- ❖ Stay in touch – even if you need to be out of touch

Managing the Online Classroom

- ❖ Set (and enforce) boundaries as necessary
 - ❖ Wait to respond
 - ❖ Use technology to your advantage
 - ❖ When possible, put the burden of interactions back on the student
 - ❖ Keep copies

Managing the Online Classroom

- ❖ Be proactive
 - ❖ Communicate with dept. head or supervisor
 - ❖ Seek advice
 - ❖ Think about what you put in writing
 - ❖ Know the services and resources available at your institution



Online! AST Instructors' Training Course

Communication in the Online Classroom

Rebecca Fiedler
Acclaro Research Solutions

Cem Kaner
Florida Institute of Technology

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Course Objectives:

- ❖ Understand the philosophies of teaching and testing underlying the BBST project.
- ❖ Become familiar with the online course model used in BBST courses.
- ❖ Understand the instructor's role in online teaching including:
 - ❖ the logistics of an online course
 - ❖ course management and communication.
 - ❖ feedback, assessment, and grading to improve student learning.

Instructor Responsibilities

- ❖ Managing the learning environment
 - ❖ Direction
 - ❖ Feedback
 - ❖ Encouragement
- ❖ Provide subject matter expertise
- ❖ Regular communication
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- ❖ Establishing your presence
 - ❖ Welcome email
 - ❖ Post a bio
 - ❖ Participation

Welcoming Students

- ❖ A welcoming email
- ❖ A friendly classroom environment – even online
- ❖ An instructor bio
- ❖ Regular communication

A Welcoming Email

Welcome to BBST Foundations!

To: Student@institution.edu
Cc:
Bcc:
Subject: Welcome to BBST Foundations!

Welcome to the Foundations course. As you know, it will be delivered fully online. Michael Christoff and I will be co-facilitating the course and we're looking forward to an interesting and enlightening time as we learn more about software testing and learning.

We know this is likely to be the first online course for many of you. Some of you might even have a touch of the jitters (a perfectly natural feeling) and quite a few questions (also perfectly natural). We're providing this rather long email to answer the questions we suspect you have running through your mind.

We've included lots of tips and tricks to help you get started on the right foot. Don't let these suggestions overwhelm you. Simply take care of a couple each day between now and the start of class, and you'll be ready to go.

'Logging Into the Course
The course is delivered through an open-source course management system named Moodle. To view the course website and participate in the discussions, you will need to login to the class.

Course website: <http://cs.fit.edu/bbst/> and choose BBST Foundations. Sign up for a new account. The Moodle server will create a new account for you. Once you have your account, enroll in the course.

Be sure to get started on the right foot. Try to log in to the course as soon as you can. This will give us time to get any technical problems straightened out promptly and keep you from falling behind before you even get started. We are still building the course website so you may see a few things

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- Forums
- Quizzes
- Resources

People

- Participants

Administration

- Grades
- Profile

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Your Instructors

Cem Kaner



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Asking for Help

- ❖ Designate a forum for Help! requests
- ❖ Require students make help requests in the forum, except in the case of personal matters or grade-related discussions
- ❖ Decide (and announce) whether students should help each other. I generally recommend they do so.
- ❖ Provide guidance on seeking help

Instructor Bio

- ❖ A descriptive subject line
- ❖ Name and location
- ❖ Work experience and education, as appropriate
- ❖ Hobbies or interests
- ❖ (optional, but desirable) Photo or video

Regular Communication

- ❖ Set the pace for the class
- ❖ Establish instructor presence
- ❖ Keep students active and engaged
- ❖ Connect course tasks to the real world or current events
- ❖ Highlights of the coming week (or unit)
- ❖ Point out interesting or challenging areas
- ❖ Share additional resources, if any
- ❖ Unit feedback
- ❖ Correct misunderstandings
- ❖ Highlight achievements

Getting Discussions Started

- ❖ Make it part of the grade
- ❖ Setting your expectations
- ❖ Designing participation into assigned activities
- ❖ Designing for student-to-student interaction
- ❖ Organizing discussion forums
- ❖ Establishing protocols for discussion forums
- ❖ Encouraging participation

Communication Recap

- ❖ Introductions are important. Include human interest details.
- ❖ Mind your manners
- ❖ Establish protocols
 - ❖ Response time
 - ❖ Requests for help
- ❖ Edit your response (maybe wait a day)
- ❖ Watch your tone – especially guard against being terse
- ❖ Conveying emotion
- ❖ Humor – use it cautiously!

Questioning Strategies for Instruction

Full Spectrum Questioning for Critical Thinking

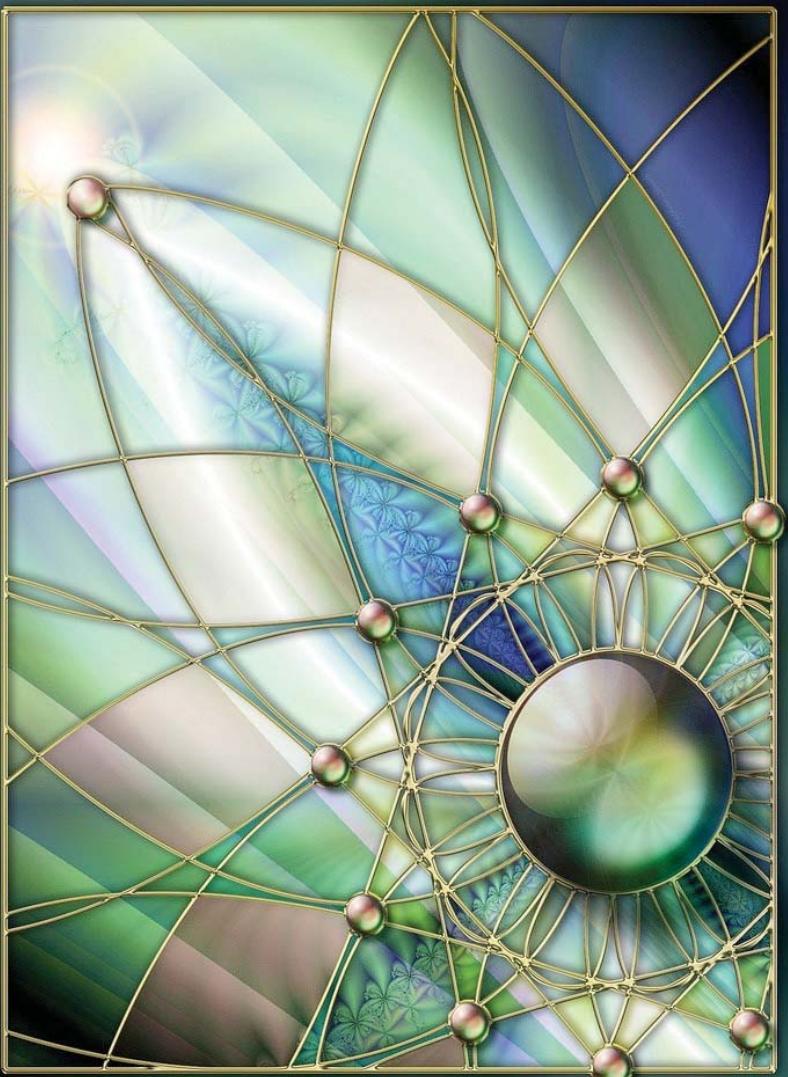
| Questions that probe the “so what” response | Questions that clarify meaning or conceptual vocabulary | Questions that explore assumptions, sources, and rationale | Questions that seek to identify causes and effects or outcomes | Questions that consider appropriate action |
|---|--|--|--|--|
| <p>How relevant or Important? To whom? To what constituency? Individuals or groups? What viewpoint would impart importance? Is that me/us/them? What audience is assumed? If we knew all about this, what good would it do?</p> <p>How urgent or Interesting? Is immediate consideration needed? Or, is the detail best left for other times or forums? Is the issue compelling, or tangentially related to my or the group's task at hand? Is the issue of intellectual merit?</p> <p>What context? Is the issue or question part of a larger view or strategy?</p> | <p>Is there Ambiguity or Vagueness? Are terms clear or meanings commonly shared? What alternative meaning might exist? Can quantifiers be made more explicit? How much? How long? How few? To what extent? Can implicit comparisons be made explicit?</p> <p>Are Concepts Held in Common? Are terms relying on professional or technical understandings? Does meaning shift from ordinary usage to technical sense? Is persuasion confused with definition? What might be a similar example in another area?</p> | <p>What Qualities are Assumed? Is the claim or phenomena assumed to be "Real, unique, measurable, beneficial, harmful, neutral"? Might the opposite assumption be equally valid? Are biases or preconceptions evident in gender, audience, and categorization? What does the speaker assume about herself or himself or the audience?</p> <p>Can One Be Sure? What evidence supports the claim? How can it be confirmed? What are reasons for belief or disbelief or assigning value? What procedures or processes give evidence for certainty? What supports any analogies?</p> | <p>Primary v. Secondary? Is the claim/condition a root or secondary cause or effect? Is it a trigger for other mechanisms? What are they?</p> <p>Internal/External v. Systematic Interaction Is the cause/effect mechanism internal or partly external to the system? What external factors affect interactions? Are reputed "causes" perhaps correlations? At what level might true causes operate? Are consequences long or short-term? For whom? What limits or scenarios might apply? What are worst/best cases? What is most probable? Why? If cause/effects are connected systematically through feedback, what are the key feedback controls?</p> | <p>Who Does What, How, When, with Whom, and Why? Is there a quick fix or is a more considered view needed? Should I/we do something? Together, separately, as a group? Should it be done now? When? What is the commitment? Are those involved too close to act effectively? Are outsiders needed? Who can be engaged? What plans or strategies will be effective? What level/conditions need addressing first?</p> <p>What Comes Next? How is effectiveness evaluated? What ongoing monitoring or re-evaluating of intervention is needed? Is there a backup plan? Who directs it? Under what conditions is it operative?</p> |

The Facilitator's Palette

Another Tool for Your Toolbelt

| The Facilitator's Palette | | | | |
|-------------------------------|--|--|--|---|
| Voices | Tones | Critical Thinking Strategies | | |
| Generative Guide | Helps participants discover alternatives that are new or previously overlooked | Neutral - a good baseline for interactions | Analytical - a specific form of neutral | Identifying direction Analyzes discussion to suggest possible directions or alternatives and/or asks for thoughts |
| Conceptual Facilitator | More like an instructor, this voice can be used to focus attention on conceptual areas that need attention | Curious - particularly useful for pointed questions | Informal - | Sorting ideas for relevance Helps participants identify relative importance of the active lines of thought and discussion |
| Reflective Guide | Uses restatement to refocus conversation or exploration in a fruitful direction | Humorous - frequently useful but must be used with care | Nurturing - used when the going is tough & progress is slow | Focusing on key points Works with all 6 voices; might be the best strategy for mediation; lists contributions and highlights connections |
| Personal Muse | Models internal dialogue such as examining beliefs, thinking critically, digging deeper, breaking barriers | Imaginative - for when you are inspired to be creative | Whimsical - also one of the more creative tones | Full-spectrum questioning Helps lead a discussion onto more substantive ground |
| Mediator | Moves discussion away from stated positions toward new lines of inquiry; clarifies issues; restates goals, etc | | | Making connections Uses analogy, inference, and other techniques to help participants break the barriers of their assumptions or beliefs |
| Role Play | Takes on a persona to introduce alternative perspectives or encourage dialogue in other directions | | | Honoring multiple perspectives Most useful in mature dialogues, the facilitator outlines the variety of views or perspectives |

Abstracted from *Facilitating Online Learning: Effective Strategies for Moderators* by Collison, et al



Online! AST Instructors' Training Course

Feedback for Better Student Performance

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These notes are partially based on research that was supported by NSF Grants EIA-0113539 ITR/SY+PE: “Improving the Education of Software Testers” and CCLI-01717613 “Adaptation & Implementation of an Activity-Based Online or Hybrid Course in Software Testing.” Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Course Objectives:

- ❖ Understand the philosophies of teaching and testing underlying the BBST project.
- ❖ Become familiar with the online course model used in BBST courses.
- ❖ Understand the instructor's role in online teaching including:
 - ❖ the logistics of an online course
 - ❖ course management and communication.
 - ❖ feedback, assessment, and grading to improve student learning.

Instructor Responsibilities

- ❖ Managing the learning environment
 - ❖ Direction
 - ❖ Feedback
- ❖ Encouragement
- ❖ Provide subject matter expertise
- ❖ Regular communication
 - ❖ Tone
 - ❖ Humor
- ❖ Pre-course set up
 - ❖ Checking course content
 - ❖ Updating task lists
 - ❖ Scheduling quiz closings
 - ❖ Sending welcome email
 - ❖ Getting policy agreements
- ❖ Wrapping up the course
 - ❖ Establishing your presence
 - ❖ Welcome email
 - ❖ Post a bio
 - ❖ Participation

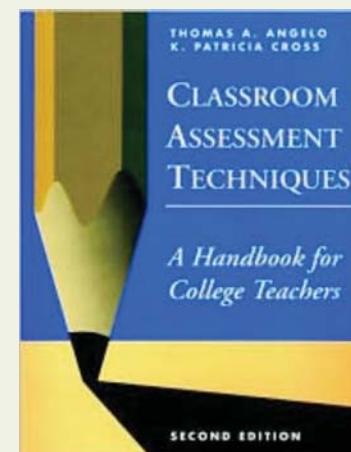
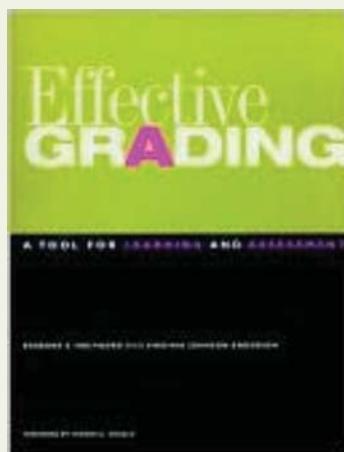
Feedback and . . .

- ❖ Instruction
- ❖ Assessment



Assessment

- ❖ Most AST BBST assessment is formative
 - ❖ Quizzes
 - ❖ Exercises and activities
 - ❖ Exams
- ❖ Final exam – or maybe final review – is summative



Formative vs summative assessment



"When the cook tastes
the soup, that's
formative; . . .

when the guests taste the
soup, that's summative.

--Robert Stake



Giving effective feedback is hard:

- ❖ What's good for one student isn't necessarily good for another student.
- ❖ Feedback should be specific and detailed, but not too specific and detailed
- ❖ Feedback should be immediate except when delayed feedback is better

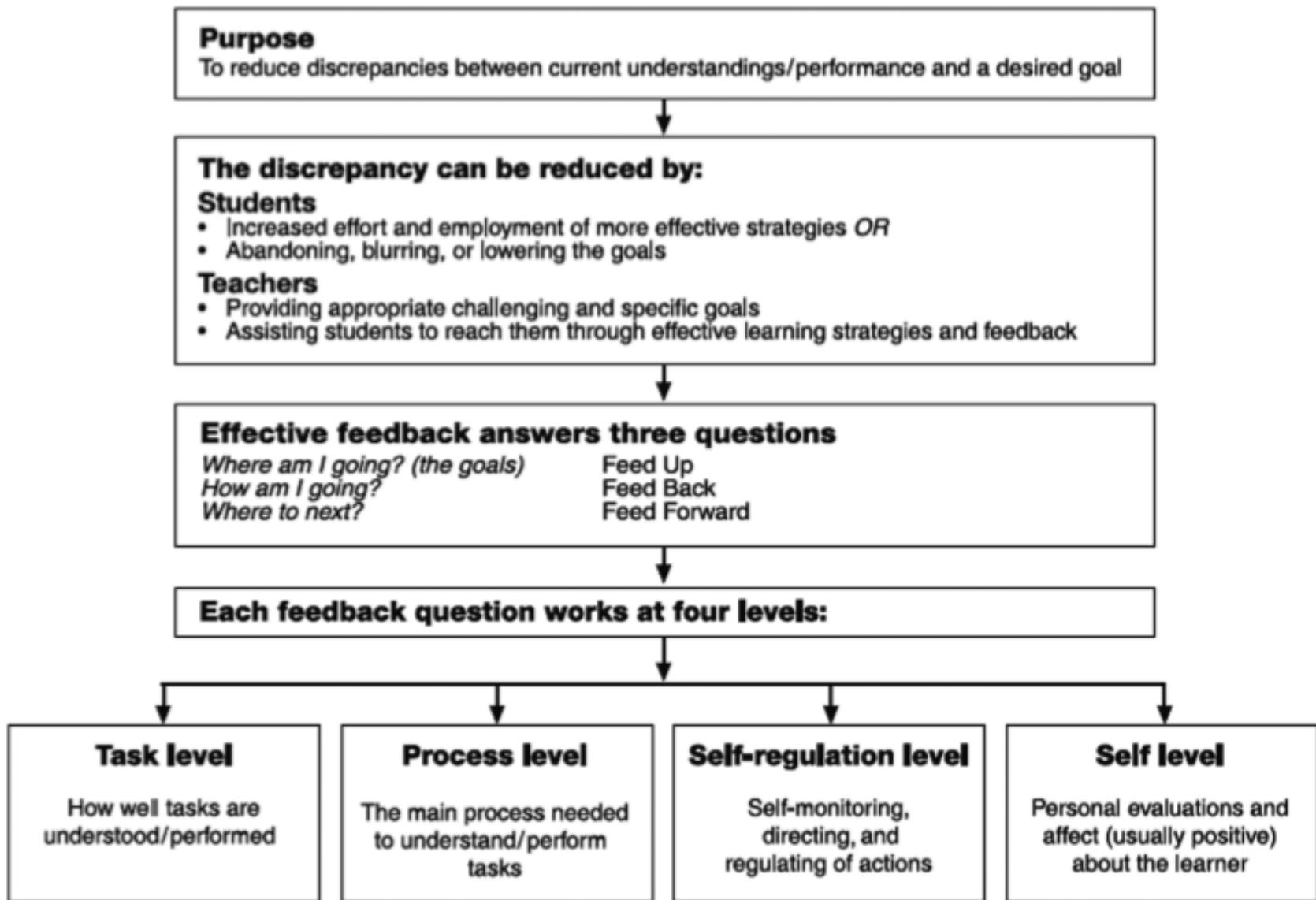


FIGURE 1. *A model of feedback to enhance learning.*



My Favorite Learning Lab . . .

Useful when I need to learn anything

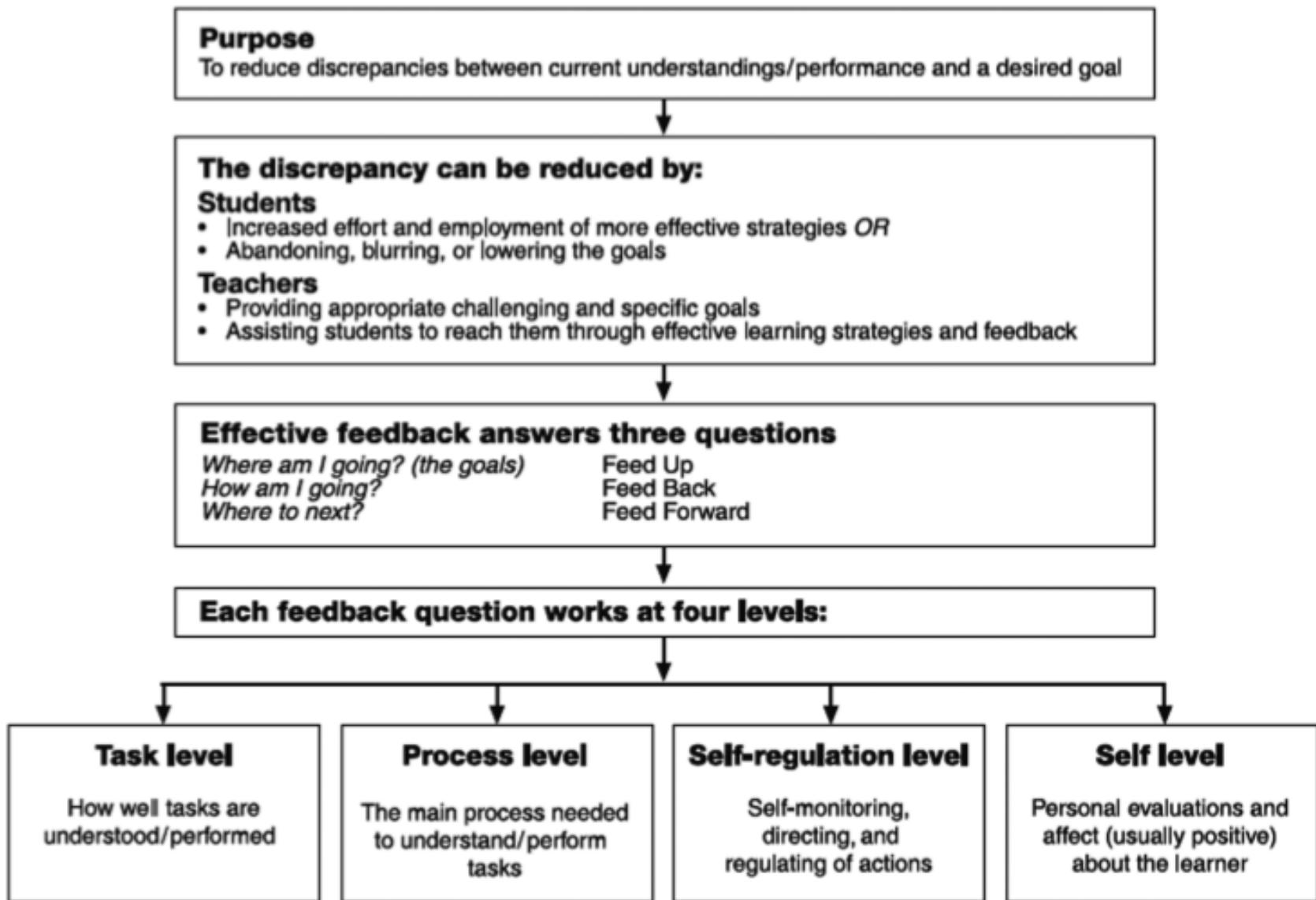
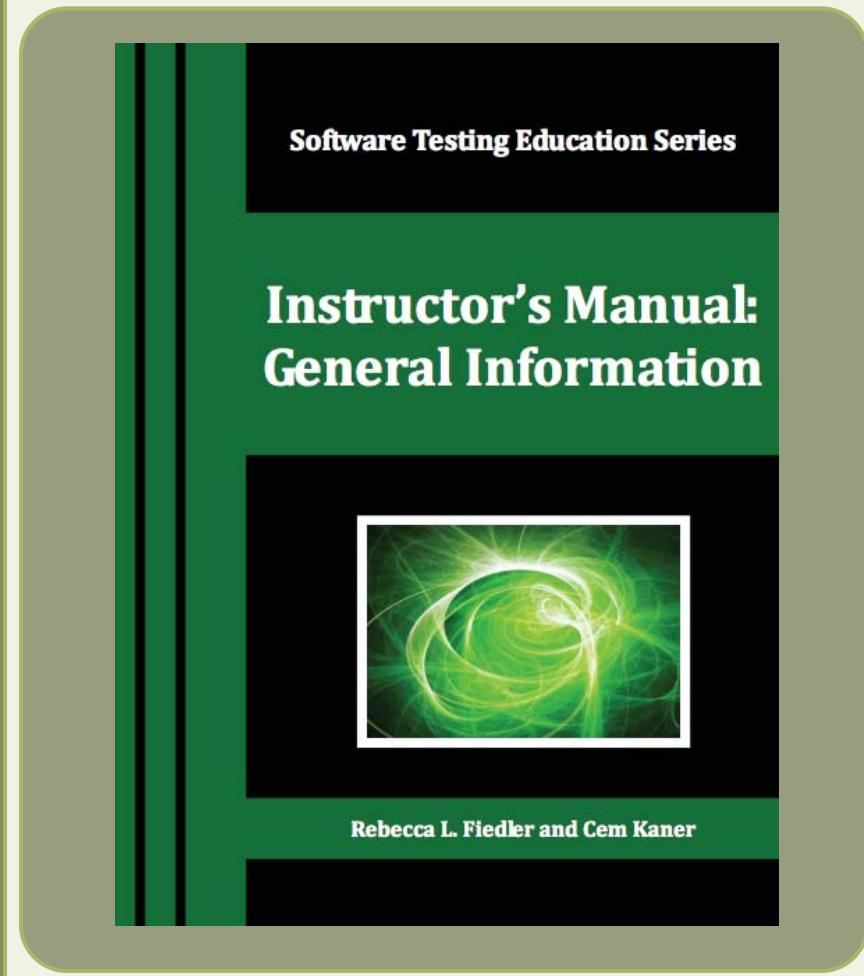
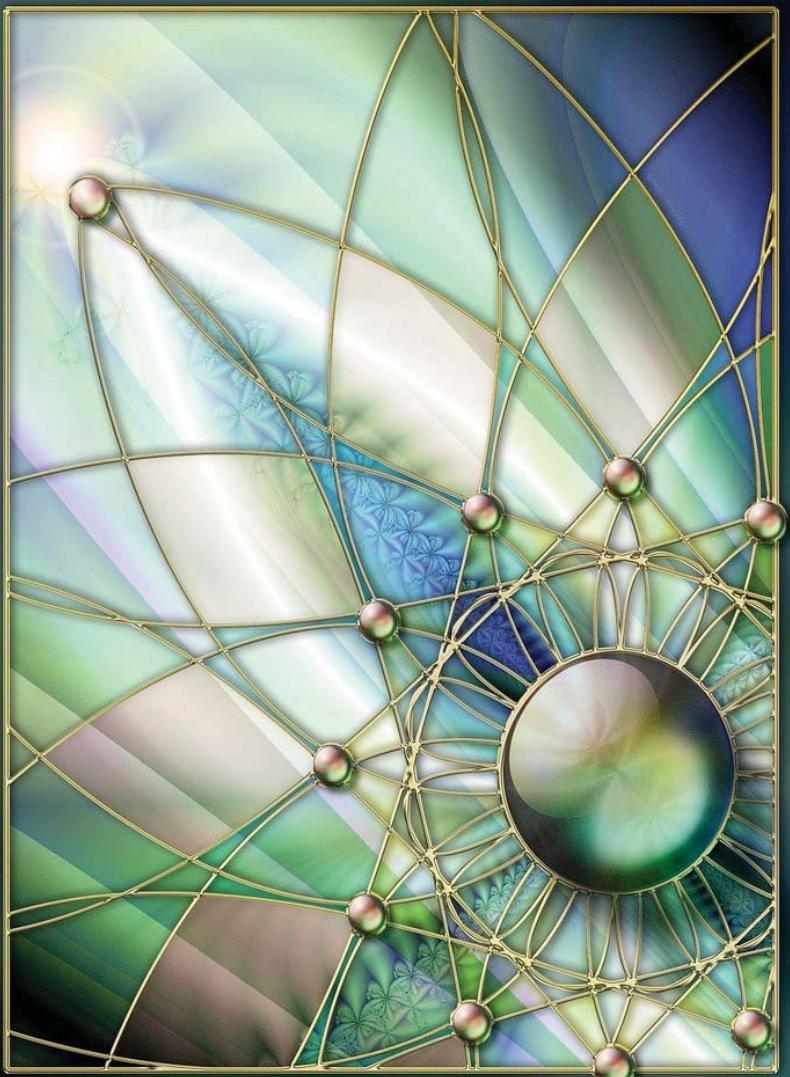


FIGURE 1. *A model of feedback to enhance learning.*

More Tips on Feedback



Refer to the Instructor's Manual: General Information for more tips on giving feedback



Online! AST Instructors' Training Course

Assessment and Grading

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Grading Tips

Creating Grading Guides

- ❖ Maybe you only need a checklist
- ❖ For more complex assignments, a matrix is useful
 - ❖ List the things that “count” down the side
 - ❖ Decide how many different levels of performance you care about and list them across the top
 - ❖ In the empty cells, think about how you would describe the level of performance for each thing that “counts”

| Grading Question | Assessment |
|--|------------|
| Does this answer directly address the question that was asked? (That is, is everything in this answer RELEVANT to the question?) | |
| What were the key strengths of this answer? Why do you think so? | |
| What content (if anything) was missing in this answer or would have improved it? | |
| How well was the answer worded and organized? | |
| Does the structure of the answer map to the structure of the question? | |
| Is every part of the question answered? | |
| Was this answer copied from an answer in the forum or from any other source? (if so, assign a grade of 0) | |
| GRADE | A |

| Grading Question | Notes | Grade |
|--|-------|-------|
| Does this answer directly address the question that was asked? (That is, is everything in this answer RELEVANT to the question?) | | B |
| What were the key strengths of this answer? Why do you think so? | 1 | B |
| What content (if anything) was missing in this answer or would have improved it? | 2, 3 | C |
| How well was the answer worded and organized? | | B |
| Does the structure of the answer map to the structure of the question? | | B |
| Is every part of the question answered? | | B |
| Was this answer copied from an answer in the forum or from any other source? (if so, assign a grade of 0) | | |
| Overall Grade | | B |

Notes

1. The differences in the oracles and the differences in the examples of using them were a strength.
2. The oracles needed more explanation. I could have said how the oracles provide justification for the tests.
3. The example in the second oracle was either too subtle, poorly worded or both. I meant to say that if you are comparing against a spec (a big part of my current job) then reference implementations may make for automated testing but will fail to find spec non-conformance.

BBST Initial Posting

| CATEGORY | Expert | Professional | Amateur | Uninformed |
|---|---|--|--|--|
| Responsiveness to the Assignment | Contribution clearly relates to all aspects of the assignment. Work includes several supporting details and/or examples. | Contribution clearly relates to most aspects of the assignment. Work includes few supporting details and/or examples. | Contribution relates to some aspects of the assignment. Few details and/or examples are given. | Information has little or nothing to do with the assignment. |
| Evidence of Expertise | Writing demonstrates command of the relevant professional literature beyond that which was assigned and draws on that knowledge to offer supporting details and/or examples. May also draw on rich, relevant personal experience. | Writing demonstrates knowledge of secondary and web resources beyond the assigned reading. Draws on that knowledge, along with relevant personal experience to offer supporting details and/or examples. | Writing demonstrates knowledge of the assigned reading. Contribution draws on the reading, along with personal experience to offer supporting details and/or examples. | Writing fails to demonstrate any knowledge of required reading, instead relying solely on one's own opinion and personal experience to offer supporting details and/or examples. |
| Quality of Writing | Writing is clearly organized with a thesis statement and carefully written paragraphs (introductory sentence, explanations or details, and concluding sentence) in support of that thesis. | Writing is clearly organized with a clear point. Most paragraphs are carefully written (introductory sentence, explanations or details, and concluding sentence) and contribute to the purpose. | Writing lacks organization, but manages to convey the intended message. Paragraphs are disorganized, but coherent. | Writing lacks organization and a message. |