

The Thoughts and Questions Method

It Changes Everything! The Simple Change that Fundamentally Alters Teaching and Learning

Would you like your students to...

- Read more of the assigned readings and read them more deeply?
- Attend and contribute to class more frequently, even if they are too shy to speak up?
- Ask more – and better – questions?
- Learn to monitor their own understanding so they can focus on topics they don't understand?

Actually, how would you like achieving *all* of those goals with just one change to your teaching? I began using a new method in my classes a few years ago, and feel as if I stumbled onto a simple, powerful, and almost magical secret that has profoundly changed my students' learning – and my teaching. When I asked a colleague whether she had tried this method, she replied, "It changes everything!" This note introduces the method and explains why it is so effective.

The method consists of four simple steps – two of which you probably already do in your classes. These are:

1. Ask your students to do the reading before class (you probably already do this)
2. Ask your students to do the reading thoughtfully (you probably already do this)
3. Ask your students to respond in writing to two or three prompts about the reading – and to send their thoughts and questions to you well before class
4. You read their thoughts and questions before class and use them to help shape the upcoming session (and show some of their comments in class).

This method is commonly called "Just-in-Time-Teaching," although I prefer "Thoughts and Questions," which puts the emphasis on the students rather than the teacher. Plus, the acronym TQ is much more euphonious than JiTT.¹

Truth-in-Advertising Disclaimer: There really is no magic here – and this method may not fit your teaching style. But the Thoughts and Questions (TQs) method really changes the student/teacher relationship and increases the opportunities for student learning in several important ways. If you can find another method that achieves these benefits with so little investment of time on the part of both students and teachers, use it – and please tell me about it!

Benefits of Using TQs

Many benefits emerge from this simple technique. The list below comes from the teacher's perspective, both my own observations and those of colleagues (for a student perspective, see the Afterword). While

¹ See <http://jitttl.physics.iupui.edu/jitt/what.html> and Simkins, S. & Maier, M. (Eds.). (2009). *Just in Time Teaching: Across the Disciplines, and Across the Academy*. Sterling, Virginia: Stylus Publishing.

these benefits accrue in classes of all sizes, they are especially apparent in larger classes, where it is typically difficult to get to know individual students.

TQs change the relationship between the professor and students

1. **Uncovering student confusions and excitement, early and often:** TQs enable the teacher to see which parts of the reading students found especially challenging and which parts most engaged them. This information comes in before class, which makes class time more efficient and effective.
2. **Watching students grow:** TQs help the teacher see how a student's thinking becomes deeper and richer over the course of the semester, as students learn to examine their own understanding and articulate their thoughts more clearly.
3. **Getting to know students as individuals (at least a bit):** Through TQs, the teacher can begin to know the personalities and interests of many of their students, and learn about them in ways that would not otherwise be possible in a large class. This is especially important for quiet students who rarely or never speak up in class.
4. **Acknowledging students' contributions:** When students see their TQs projected in class, they receive a genuine reward that has nothing to do with grades (especially if the teacher acknowledges their comment with eye contact). Students sit up and start elbowing neighbors, whispering, "That's my TQ!" This recognition resonates deeply with students.

TQs create a safe place for students to learn – and feel respected

5. **Increasing communication between teacher and student:** Because TQs are ungraded, they allow students to propose new and risky ideas – without any loss of face or threat to their grade. They also enable students to speak their minds in ways they would not risk on an exam or in a paper. They can – and do – occasionally rant and rave, without fearing for their grade. TQs are a deeply honest mode of communication between student and teacher.
6. **Enabling students to say "I Do Not Know:"** TQs allow students to privately say that they do not understand certain topics and to ask for help. With such TQs projected in class, students see that others also had trouble with the difficult issues, which is deeply comforting.
7. **Respecting students:** Students feel that the teacher is genuinely interested in their thoughts and questions. With the expectation of a good faith effort (and ungraded TQs), students feel treated like adults and part of a conversation, rather than having work demanded from them.

Learning to learn (or Metacognition)

8. **Engaging students:** Students report that TQs spur them to read more frequently and with greater understanding, which helps them engage with the class.
9. **Learning and improving crucial skills:** The TQ process asks students not only to read the material but to wrestle with it.
10. **Improving their question-asking:** Students get a great deal of practice in asking questions with TQs – and their questions typically improve significantly over during the semester.
11. **Directing their own learning:** The students learn to better recognize what they do and do not understand; they also recognize and appreciate that they are helping to shape the direction of the course through their TQs.

After reading the students' TQs, I walk into class knowing a lot more about what the class as a whole thinks and what individual students think. It makes a huge difference in a course.

Notes on how to use TQs

Several faculty members across Brandeis University have begun using TQs in subjects such as advanced Philosophy, non-majors Astronomy, Environmental Studies, Computer Science, and graduate courses in Social Policy, Biology, and Business. While each professor uses TQs differently, here are several guidelines my colleagues and I find useful.

Recommendations of how to use TQs

- **Sharing students' thoughts:** Carefully select about 4-5 student comments to project onscreen (or write on the board) as discussion-starters during each class session. You can use TQs to: juxtapose conflicting views to launch a fruitful discussion; suggest intriguing directions for exploration; raise confusions or conceptual problems that several students encountered. Other than the projected TQs, I usually do not have students see each others' writings. That said, late in the semester you may give students the option of sharing their TQs with the rest of the class; students often respond to others' ideas in their own TQs.
- **Anonymity:** Project TQs anonymously, although the teacher knows who wrote each one.
- **Grading (not!):** Do not grade TQs on quality; if a student submits a certain number of thoughtful, good faith effort TQs during the semester, they get full credit for 8-10% of their final grade. Many students choose to submit more TQs than the requirement, as they find them helpful in doing the reading.
- **Thoughts *and* Questions:** Encourage students to submit both questions and thoughts; their questions frequently prove especially valuable.
- **Submission mechanics:** Students can submit their TQs via a Google form or other online system. Whatever form the submissions take, it is really helpful to get all of the students' TQs for a given class session automatically loaded into a single downloadable file.²
- **Frequency:** In medium and large classes (40+ students) have students write a TQ roughly every other class (e.g., they submit 10 TQs for the semester in courses that meet twice per week). This keeps the volume manageable for both teacher and student. In small classes, students might write TQs for most class sessions.
- **Timing:** Students submit their TQs several hours to a day or more in advance, to give the teacher time to read and make use of their ideas. In a class of about 30-40, you might set the deadline the night before class; in classes of 80 or more, the deadline might be 36 hours before class. For classes that meet twice a week, half of the students submit for the early day (e.g., the "Tuesday" group) and the other half for the later day (the "Thursday" group). If a student misses a due date, they can just submit on the next date (i.e., not their regular turn).

² This document probably has appended to it instructions for creating a Google form. Note that TQs are really not about the technology; students could submit their TQs on paper the day before class – although the electronic version is much simpler in practice.

- **Large classes:** In large classes (say more than 100), you might read just a sample of the TQs rather than all of them, as a sample typically gives a good sense of what issues are present. Teaching assistants can review the TQs before the teacher sees them, noting common confusions and interests, plus especially insightful comments (this helps with quick turnaround!).
- **Feedback:** One need not give individual written feedback on TQs, although if a student's comment is especially intriguing (or worrying), you can reach out to the student.
- **Difficult topics:** When discussing a sensitive topics, one might allow students to submit their work completely anonymously, so that they can speak their minds freely.

Different types of TQs

Several different types of TQs exist; these are just a few options.

- General purpose open-ended questions: These allow the student to examine the reading with an open mind. You might ask, What did you find most confusing or challenging in the reading? and What did you find most interesting? These yield surprisingly rich responses, as students soon grow comfortable with these questions and use them as starting points for all kinds of issues. These are my most frequently used questions.
- Open-ended questions tailored to specific issues in the reading: These can be quite powerful, and many professors gravitate toward using these initially. However, such questions may constrain students' thinking and cause them to focus on just a few topics that you identify. Here are examples from my Animal Behavior class:
 - *What methods did the authors use to study group decision-making in honeybees?*
 - *Which aspects of the study designs seemed most elegant to you?*
 - *Please write a paragraph or two describing an example of the Prisoner's Dilemma that you have observed over the past few weeks. You should write about something going on in real life where you can see the outlines of the game (e.g., interactions between two people, or a person and an animal).*
- Multiple choice questions: These are easy for the professor to apprehend quickly and, if crafted well, can be effective at uncovering students' misconceptions. That said, they do not create most of the relationship-building benefits of TQs and I rarely use them.
- Private (to the teacher only) or Public (viewable by the whole class): I typically keep students' TQs private (unless I show them anonymously in class) which greatly strengthens the student/teacher relationship. That said, a number of my colleagues have had great success in creating message boards (or similar systems) where students read and comment on each other's postings; some even require their students to comment on a certain number of colleagues' TQs. This public style leads to great interaction among students, while the private style (to the teacher only) gives students a channel for communicating honestly and builds the student/teacher relationship. There is no right answer on how to do these.

Sample TQ

This TQ responds to the question, "What was confusing in the readings?" The student was in her first semester of college in an upper-level Ecology class. She not only "did the reading" – she asked questions and proposed answers; she is holding an "internal conversation" with the author.

- *On p.191, there is a quick example of stable equilibrium without oscillation showing a predator whose density decreases as its prey's density increases. What are possible causes of this? Does equilibrium suit the environment's available resources, and a large predator population is selected against?*
- *Why don't predators have hump-shaped isoclines too? The orange/yellow diagram on p.193 (Fig. 11.14b). There must be a point where, even if there is enough prey to go around, there are too many predators (like the book said, territorial behavior and breeding spaces, etc., are limiting factors).*
- *What might explain the hypotheses that generalist predators tend to cause stability and specialists tend to cause instability? Is it about more/less influence over one specific species' population?*

Sample anonymous comments from students on TQs

- *The process of filling out the TQs and then discussing them in class was SO valuable to both my learning and class experience. It was a great way to see how people really felt about the readings and the topics we were learning about, and to know that my classmates were really thinking about the material encouraged me to push myself to think about the course in other ways than I previously had.*
- *The class felt more like a discussion section for a big lecture than a 72 person class! I felt like students were having conversations with one another and with the professor through the use of TQs.*
- *I don't think I've ever kept up with class readings as much as I did with TQ's because you have to read at least a little of the chapter to even BS those. (pretty honest, right?)*
- *I really enjoyed being able to hear my peers' questions about the readings through the TQs. It helped me think of new ways to approach readings and how to ask questions. Then, having these questions incorporated into the class lecture answered the questions I may have personally held, but felt too embarrassed to ask myself.*
- *I've really enjoyed doing TQs, even though I miss some now and then I think overall they have helped me engage with my reading more and encouraged me to think more critically inside class and outside class.*

I frequently feel humbled by the quality and honesty of my students' thoughts in their TQs. At times I find myself thinking that I cannot possibly do justice to all the ideas they share with me – but TQs clearly help my students (and me) learn much more.

Afterword: On TQs

By Hannah King, a former Brandeis Undergraduate (used with permission)

The benefit of using TQs in the classroom is immense. Using TQs last semester in my Ecology course opened my eyes to what is so often lacking in other classes: namely, a dialogue inclusive of all its students.

Because I'm naturally quite shy, throughout my undergraduate career I've struggled to participate and speak up in class, and so even in those classes whose subject matter I most loved and understood, my participation grade would be lacking and my thoughts left unsaid. But with TQs, my input is a part of the discussion regardless of whether I work up the nerve enough to speak in class that day, and because of this, I am inevitably much more engaged. I appreciate so much the way in which TQs make possible a classroom structured around every student's input—his or her understanding or lack thereof, his or her interests and inquiries—because it means that what is being taught is reflective of it. In this way I believe I benefitted immensely from TQs last semester because—along with all those of my classmates—my thoughts were heard.

It seems to me that TQs also foster relationships between professors and students that might otherwise never get the chance to develop. Because TQs make explicit and tangible what confuses students as well as what topics most interest them, every student—and not just those who can regularly attend office hours or often speak in class—is able to communicate personally with the professor. It's a win-win situation.

For example, last semester, even though I wasn't able to attend office hours and was, mostly, too shy to speak in class, my professor knew that I was very engaged with the material as well as with what portions of it I most needed help. Knowing this as a student is very reassuring and encouraging.

Further, that I had to submit a homework TQ regularly helped to keep me engaged, as well. Thus TQs foster a student's engagement because there is less of a gap between student and professor, and therefore student and subject. Perhaps most importantly, the process of writing TQs helped me become more self-aware of myself as a student. I realized how often I tend to slack-off in other classes because I know I can catch up before the next exam or paper, which, even if doesn't affect my grade, inevitably lessens my day-to-day participation and engagement. I also became more self-aware of what materials and concepts I understood and which I didn't. So yes, TQs aid the professor in knowing where a student's at, but, perhaps even more vitally, TQs show the student him or herself where he or she is at, which in turn encourages a sense of responsibility for one's education. In this way, in a daily sense I was faced with

my understanding or lack thereof and was asked to articulate it. Thus this self-awareness comes in part because of the way in which TQs help students formulate questions. Last semester, I learned what an effective question is, and how best to ask it—and therefore I learned also what questions I need to ask of the material and myself in order to learn most effectively and efficiently. It seems more to me than ever now that questions have to precede their answers—that to understand a complex topic, it is vital to first be able to acknowledge and articulate the questions that precede it and are inherent to it.

In conclusion, it seems to me that TQs open the lid on learning in the sense that they greatly lessen the obstacles standing between learning and understanding. Because of this, it is my hope that more teachers and professors will utilize TQs in the future.

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