

Ways of Using TEFA

The TEFA question cycle can be useful in multiple phases of the instructional process, serving many diverse goals

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Technology-Enhanced Formative Assessment (TEFA) is a rich pedagogic approach that is intended for frequent and flexible use throughout instruction. It can be used as an occasional “drop-in” activity, but much of its power is manifest only when it is woven into the fabric of a course, changing the classroom dynamic and helping to realize TEFA’s four key values of question-driven instruction, dialogical discourse, formative assessment, and meta-level communication.

GENERAL TEFA OBJECTIVES

TEFA “question cycles” (q-cycles) can address one or more

of these general objectives:

- learn about students’ knowledge and thinking;
- help students become more aware of their own knowledge and thinking;
- set up subsequent instruction;
- provoke, open, motivate, ground, or contextualize discussion of a topic;
- catalyze small group discussion and peer learning; and
- precipitate student realizations or insights.

Few q-cycles will address *all* of these objectives, but most cycles should be designed and conducted with at least one such objective explicitly in mind.

SETTING UP INSTRUCTION

TEFA can be used to prepare the ground for subsequent instruction, setting up a fertile context and providing the teacher with information about where students are starting from. The following q-cycle uses serve this phase of instruction.

Assess prior knowledge: find out what students already know, think, believe, or perceive about a topic or situation. Do this to find out what real-world experiences instruction might build upon, what language students might have to work with, what prior beliefs or mental models may have to be integrated or confronted, etc.

Provoke thinking about something new: ask a provocative and interesting, but approachable, question to “open up” a new topic or subject. This gets students into a mind-set for forming and evaluating new ideas, and generates raw material for instruction to work with. It can also create a need for upcoming content ideas.

Stimulate discussion: spark debate by presenting a sufficiently rich context for discussion and a thorny or divisive

point to explore. The resulting discussion can motivate subsequent instruction, or itself be an opportunity for learning and teaching.

Predict-and-show: require students to predict the results of a demonstration or experiment, discuss their reasoning, do the demo, and then discuss why the reality might have differed from predictions. This pattern enhances the effectiveness of demonstrations.

Induce cognitive conflict: deliberately back students into the realization that two of their beliefs, perceptions, ideas, interpretations, or models conflict, thus creating a “teachable moment.”

DEVELOPING KNOWLEDGE

Targeted TEFA q-cycles can also be used to directly impact students’ knowledge.

Elicit a misconception or dangerous belief: get students to manifest a particular misconception or belief that will hinder their understanding if allowed to persist. Make such latent ideas explicit and help students confront and dispatch them.

Exercise a cognitive skill: pose a question that engages students in a specific cognitive activity or “habit of mind” in order to strengthen and habituate that activity or habit. This use emphasizes *how* students think about the question, rather than *what* they think about.

Build conceptual structure: Pose a question and follow up

with discussion that has students hone or extend a concept by challenging its limits of applicability; differentiate similar concepts; recognize a relationship between concepts; or apply a concept in a new or newly broadened context.

Drive assimilation: provide an opportunity for students to try out, wrestle with, improve their understanding of, and develop ownership of new knowledge.

ASSESS LEARNING

During and after instructional activities, TEFA can be used to gauge learning progress, informing both teacher and students.

Status check/exit poll: at the close of an activity, class, or topic, pose a question asking students to self-evaluate their degree of comfort with or understanding of the material just addressed. It benefits students to explicitly consider this, and the results help the teacher adjust subsequent instruction.

Find the limits of knowledge: using a set of questions or one sufficiently rich one, explore how robust students’ command of specific ideas or skills is. Identify both what they *can* and *cannot* do.

Demonstrate success: help students realize the progress they have made by asking questions that they will most likely succeed at, and then have them reflect upon and articulate the knowledge that they used to succeed. This boosts morale and helps students “own” their knowledge.

Review a topic: run through several quick question cycles about previously-covered material, both to refresh it in students’ minds and assess mastery of that material. This mode can be used in preparation for a summative exam.

CAVEATS

These three categories of uses are not independent or absolute, but merely a convenience for thinking. Some uses may very plausibly belong to more than one category. And many TEFA questions can and should serve more than one use.

This list of possible uses for TEFA question cycles is not exhaustive; TEFA is flexible enough to be of use for almost any instructional purpose. We have known teachers who integrated TEFA questions into laboratory activities: sometimes to prepare the context, sometimes for closure at the end, and sometimes to gather formative information to guide mid-course corrections. In a sense, the elements of TEFA are a powerful toolkit with many potential uses.

¹ See TEFA Note #01, *What is TEFA?*

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