

An overview of FaSMEd at the University of Nottingham 2015

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Who we worked with and what we did

9 teachers.

2 secondary schools and 1 primary school.

3 'FaSMEd' lessons for each secondary school and 2 'Fasmed' lessons for the primary school.

2 cluster meetings (plus one pending).

Formative assessment and technology

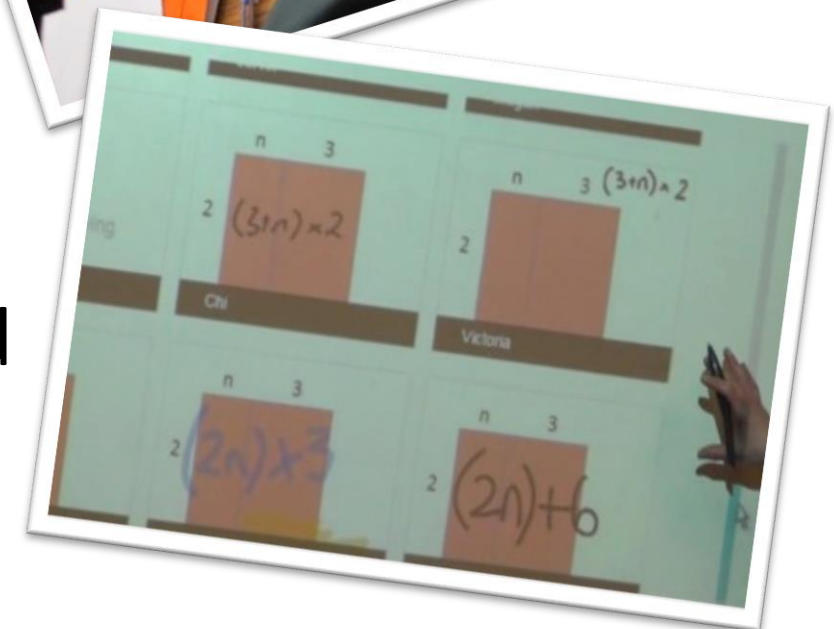
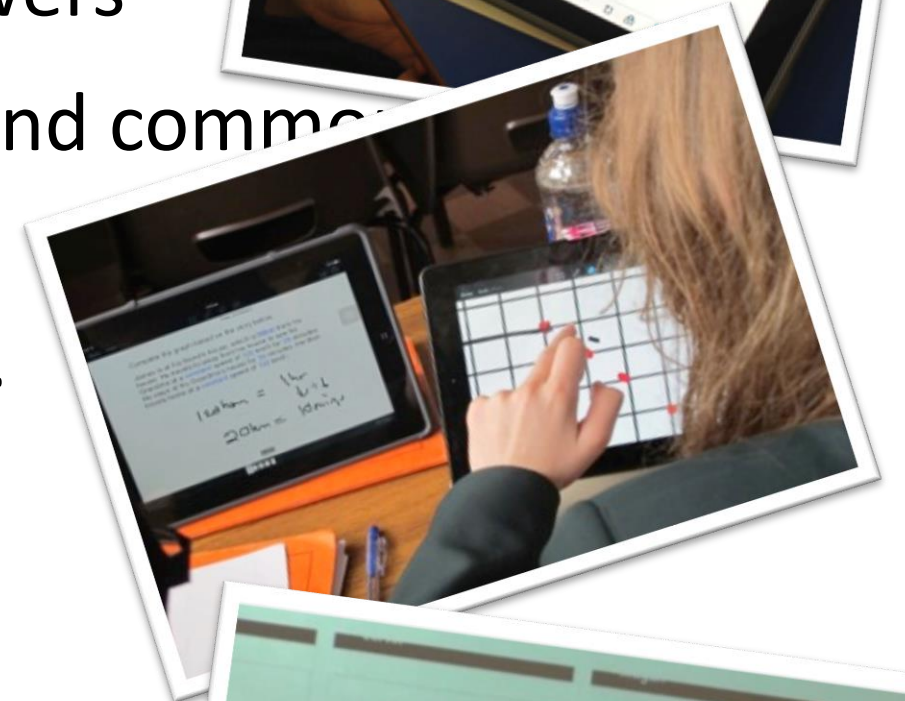
iPads in mathematics lessons

Prior to the lesson teachers used iPads to:

- Send questions to students and receive answers
- Make assessments of students' knowledge and common misconceptions
- Use their assessments to adapt lesson plans.

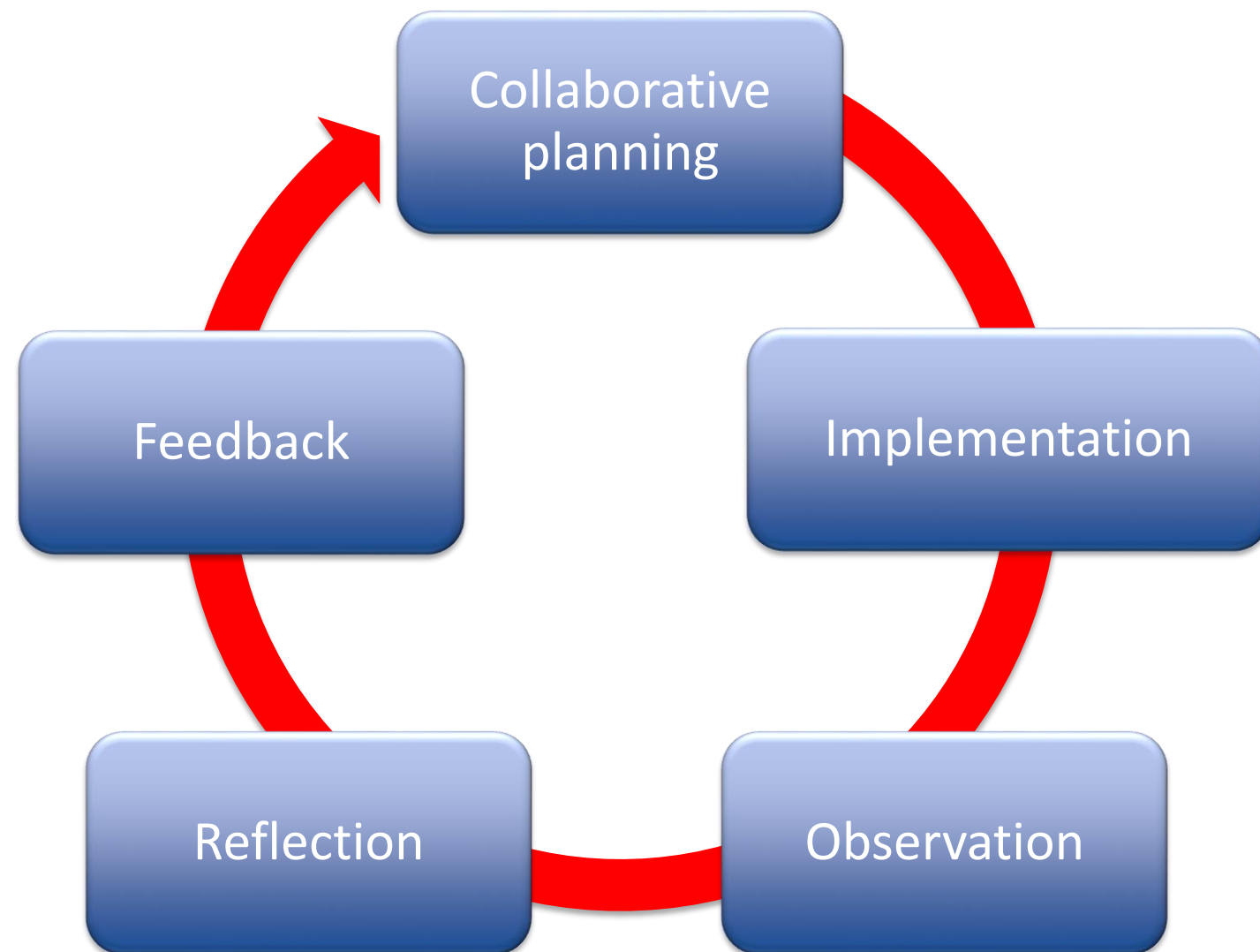
During the lesson teachers used iPads to:

- Send questions to students and receive answers
- View students' solutions or work in progress and select samples to display for class discussion



Lesson planning

A cycle of lesson planning involving collaboration, observation, reflection and feedback into the next lesson.



Interactions with teachers

- Meetings and email exchanges to plan the lesson.
- Lesson observations – recorded using video and notes.
- Meetings with the 3 teachers in each school after each had taught the lesson.
- Interviews with individual teachers after all the 3 lessons had been taught.
- Student focus groups at the secondary schools, using discussion questions and the Q sort activity.

Case study 1: Matthew

School context


- A mixed secondary school for pupils 11-18 years
- A designated 'Apple' school with 1120 pupils in a large town
- Lower than average proportion on free school meals
- Current Ofsted rating of 'good'

Class

- Year 10 (Age 14/15 years)
- Set 2 so reasonably able but not highest achieving

Matthew's use of formative assessment

Distance-time graphs

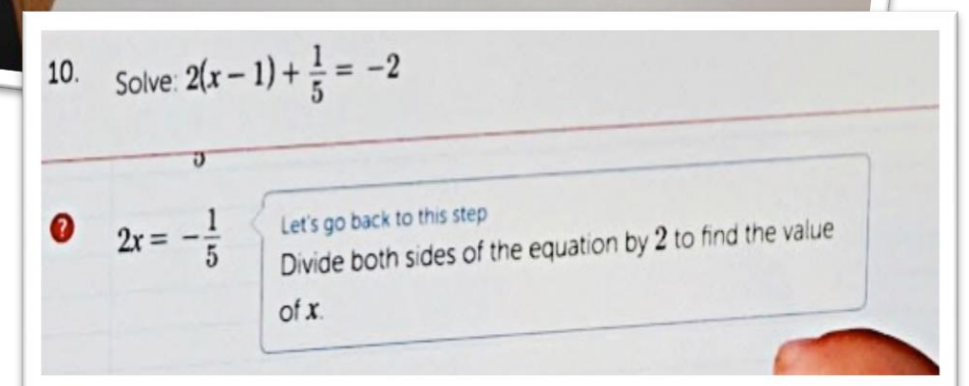
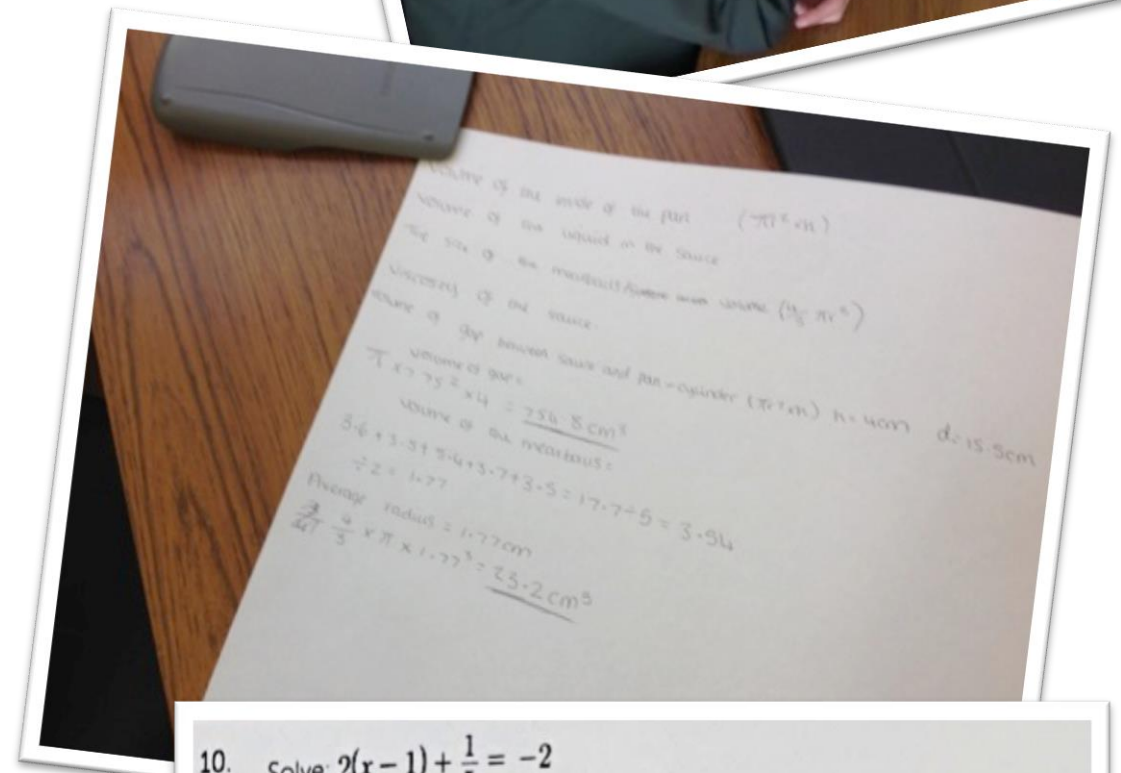
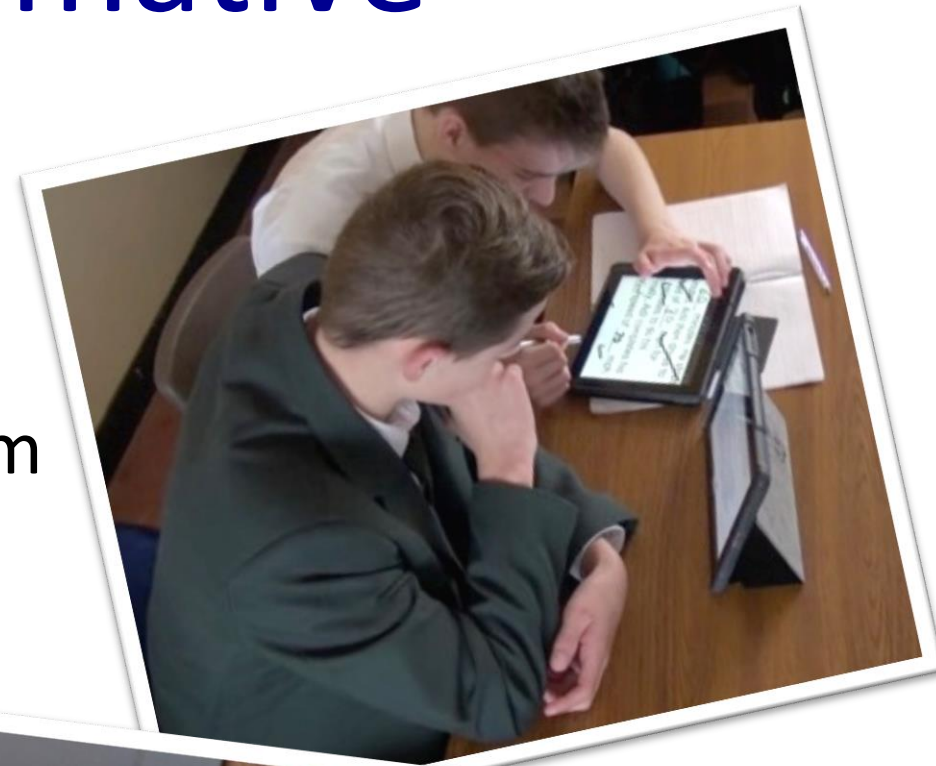
- Sending questions and receiving responses from students using *Showbie*
 - Selecting and displaying sample student work for class discussion
 - Peer assessment and self-reflection
- 

The meatball problem

- Students working collaboratively
- Class discussion

Algebraic equations

- Computer-led adaptive questioning
- Paired discussion and peer assessment of sample work



Case study 2: Carol

School context

- A mixed secondary school for pupils 11-18 years
- Part of an academy group with 1120 pupils in a large city
- Lower than average proportion on free school meals
- Current Ofsted rating of 'outstanding'

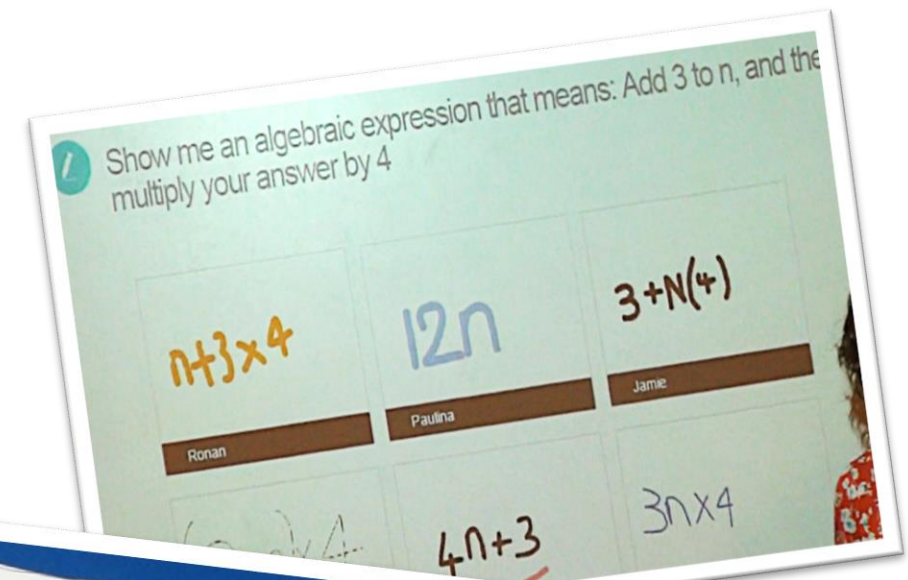
Class

- Year 9 (Age 13/14)
- Set 2 so reasonably able but not highest achieving
- Even numbers of male and female students

Carol's use of formative assessment

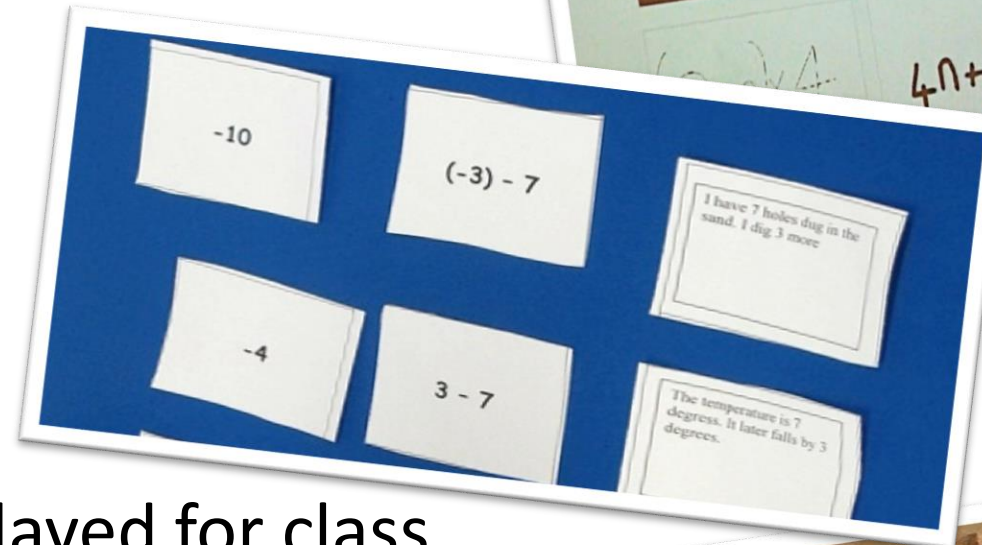
Lesson 1: Algebraic expressions

- Sending questions and receiving students' responses using *NearPod*
- Selecting and displaying sample student work for class discussion



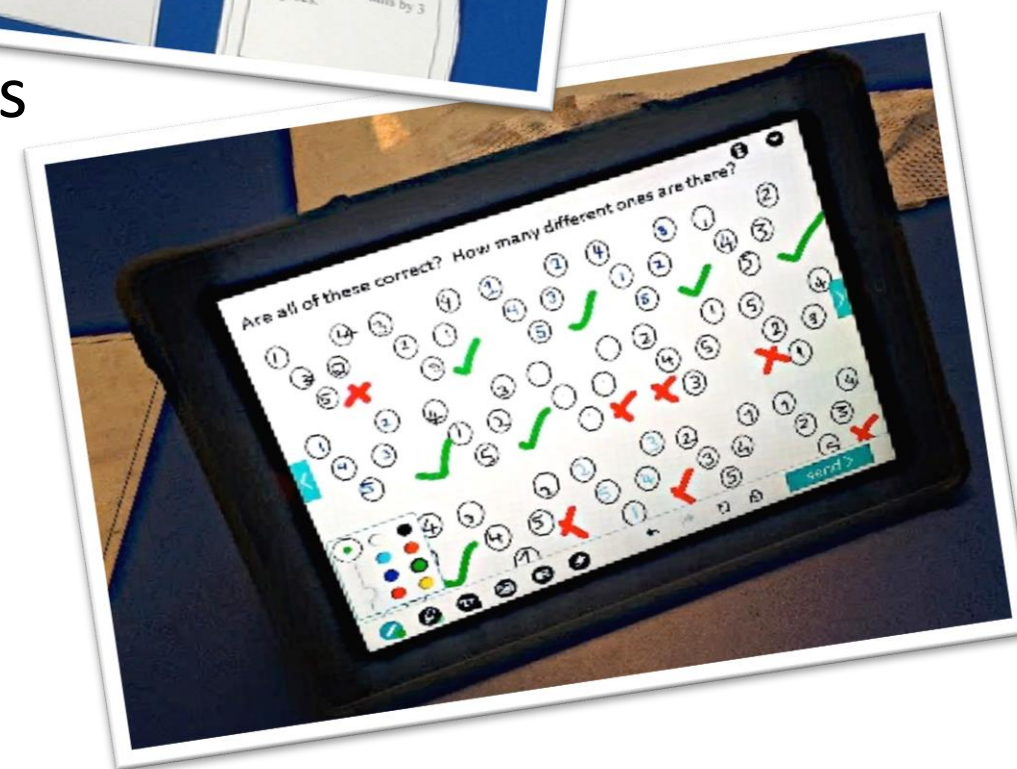
Lesson 2: Directed numbers

- Pre-lesson diagnostic work using diagnosticquestions.com website
- Collaborative work on card-sort
- Photographs of student work displayed for class discussion



Lesson 3: 'Magic V' investigation

- Pre-lesson diagnostic questions using *NearPod*
- Some collaborative work
- Interim work displayed for class discussion



Intervention cases

The lessons

1. Distance-time graphs
2. The meatball problem
3. Algebraic equations
4. Algebraic expressions
5. Directed numbers
6. 'Magic V' investigation
7. Tessellations
8. Areas and perimeters

Formative assessment areas

How is the technology used when:

- Building on students' prior knowledge
- Identifying and responding to students' conceptual difficulties
- Using questioning
- Increasing student collaboration
- Enabling students to become assessors?

Examples of the uses of technology in formative assessment processes

Building on students' prior knowledge:

Pre-lesson diagnostic assessment and class overviews are used in lesson planning.

Identifying and responding to students' conceptual difficulties:

Sample student work is selected and displayed to expose misconceptions.

Using questioning:

Student work is displayed and students are questioned about their methods.

Increasing student collaboration:

Students compare and discuss their work even when working on individual iPads.

Enabling students to become assessors:

Peer assessment takes place during class discussion and collaborative work.

Our analysis (1)

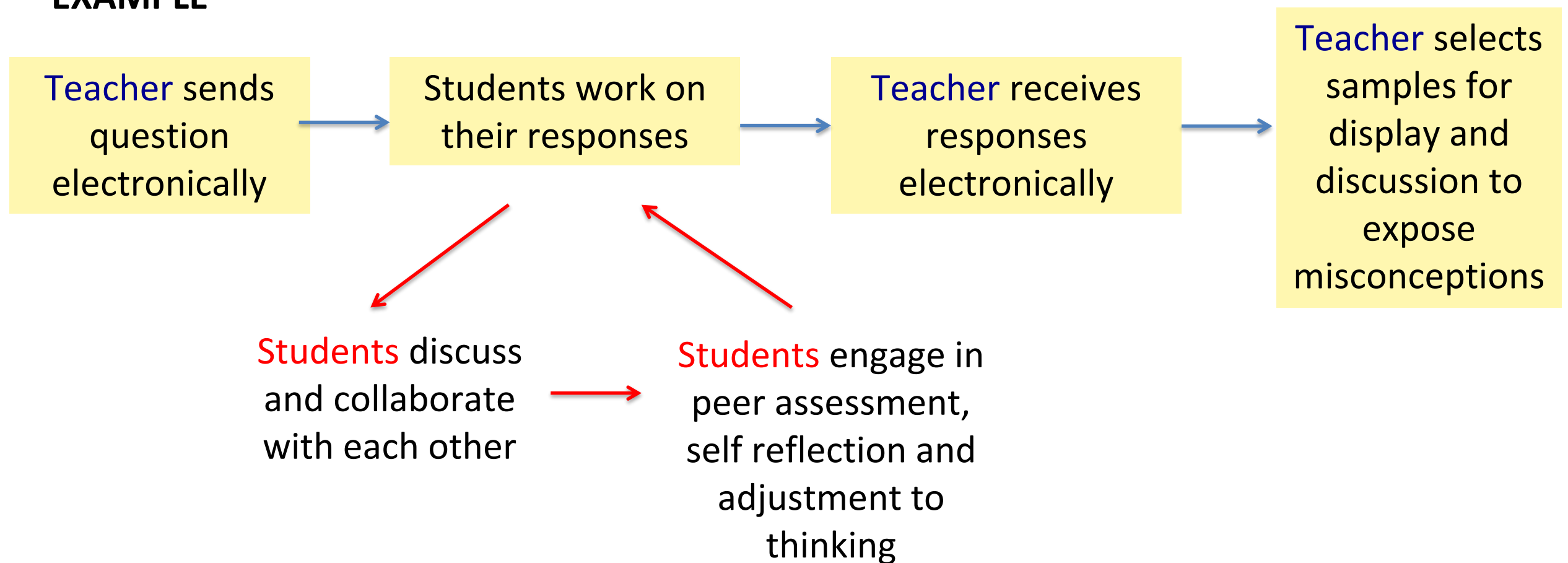
1. Identification of Thompson and Wiliam's (2007) five strategies within the lessons.

	Where the learner is going	Where the learner is right now	How to get there
Teacher	A. Clarifying learning intentions and criteria for success	B. Engineering effective classroom discussions and other learning tasks that elicit evidence of student understanding	C. Providing feedback that moves learners forward
Peer	Understanding (shared) learning intentions and criteria for success	D. Activating students as instructional resources for one another	
Learner	Understanding learning intentions and criteria for success	E. Activating students as the owners of their own learning	

Our analysis (2)

2. Identification of teacher-led, peer-led or student-led processes over different time spans and the 'nesting' of these within each other.

EXAMPLE



Our analysis (3)

3. Classification of the functions of digital technology as:
 - send and share
 - process and analyse
 - interactive learning environment.
4. Mapping of the processes of formative assessment enacted in each lesson.

ASK

Elicit information by questioning or observing.

ANSWER

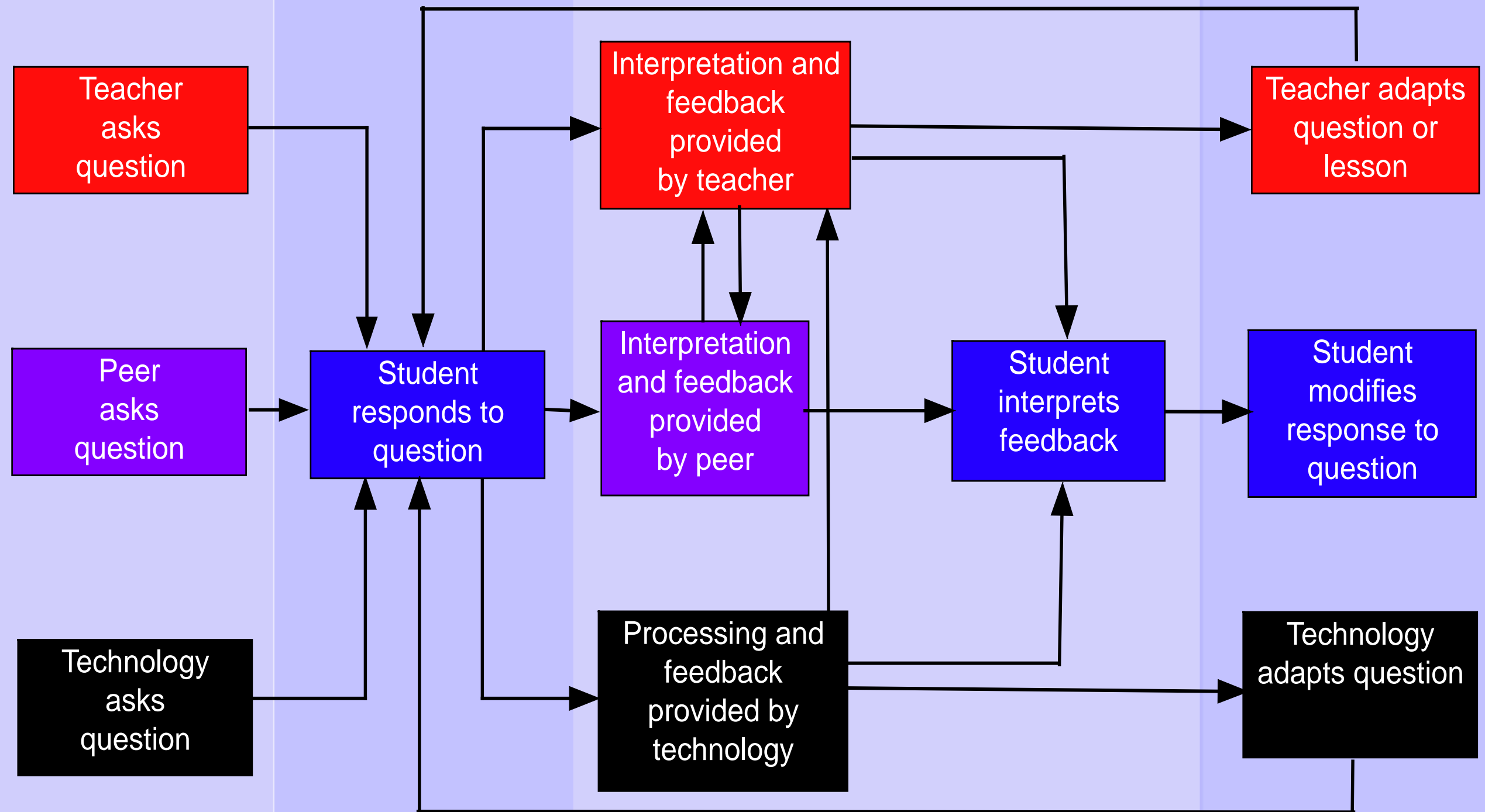
Respond orally, in writing or via technology.

ANALYSE

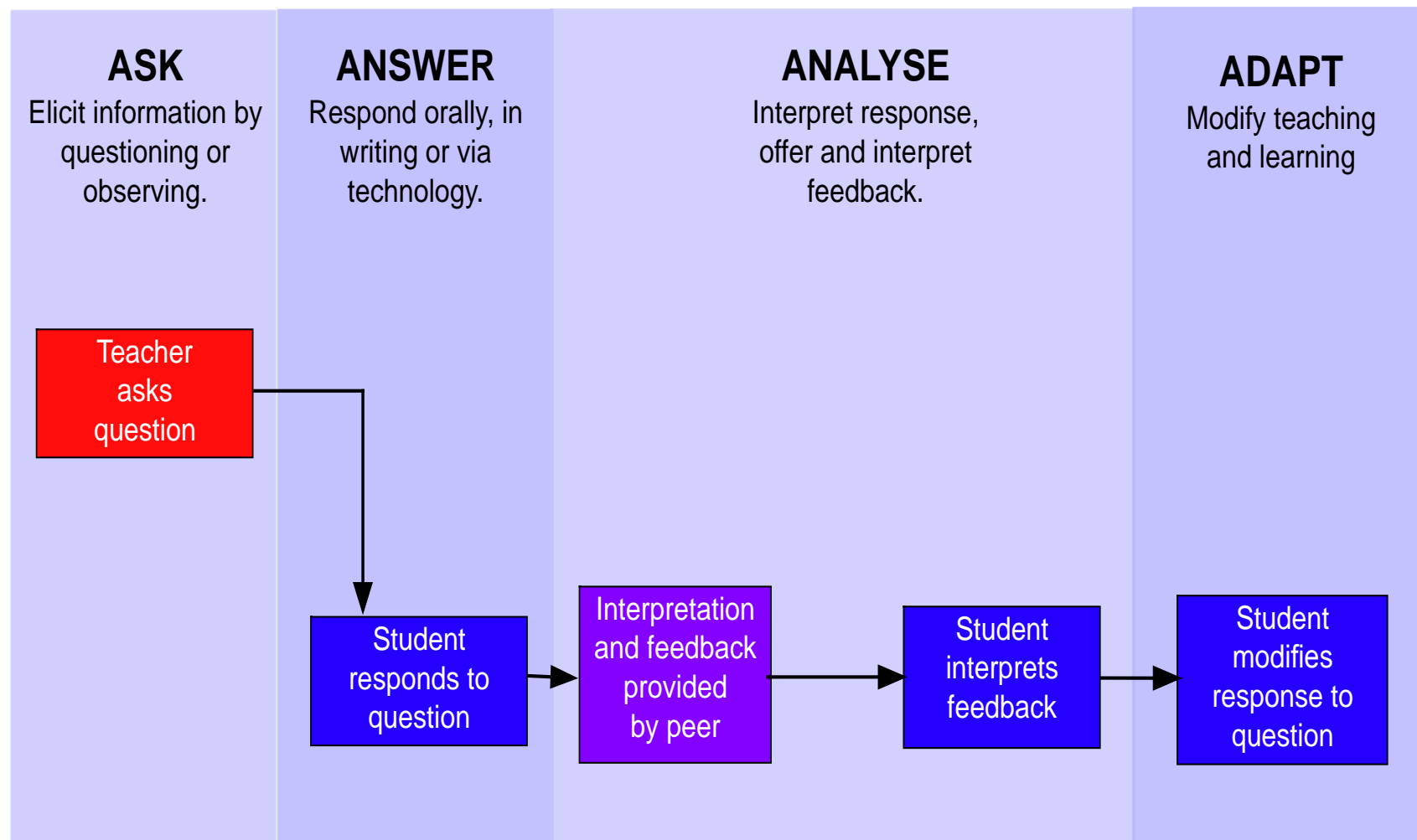
Interpret response, offer and interpret feedback.

ADAPT

Modify teaching and learning

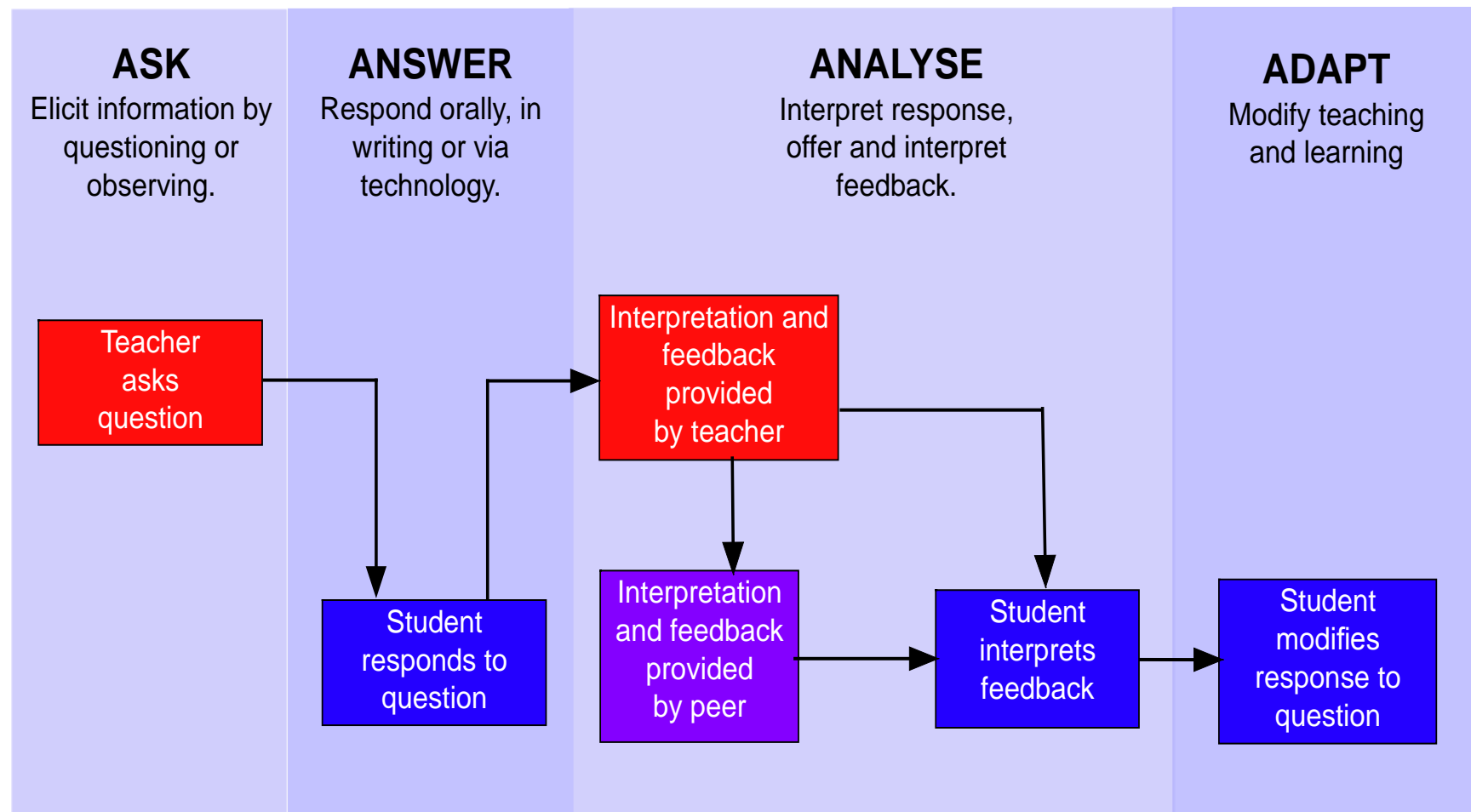


EXAMPLE 1



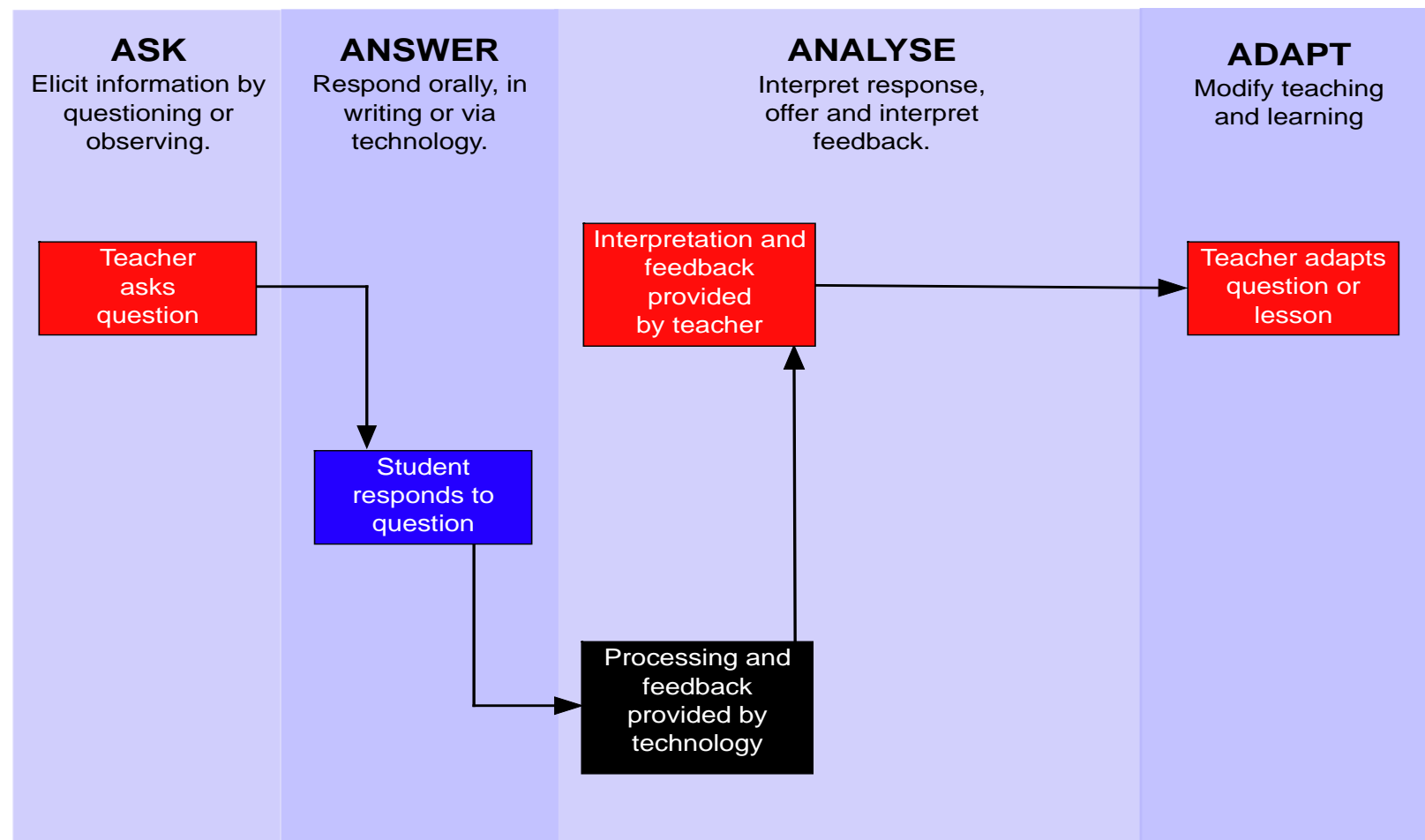
The teacher sends a question to the students electronically – the students work individually to work out solutions on their iPads and record their methods – the students then compare and discuss solutions with each other in groups – individual students receive feedback on their solutions from their peers – individual students interpret the feedback, adjust their thinking and produce improved solutions.

EXAMPLE 2



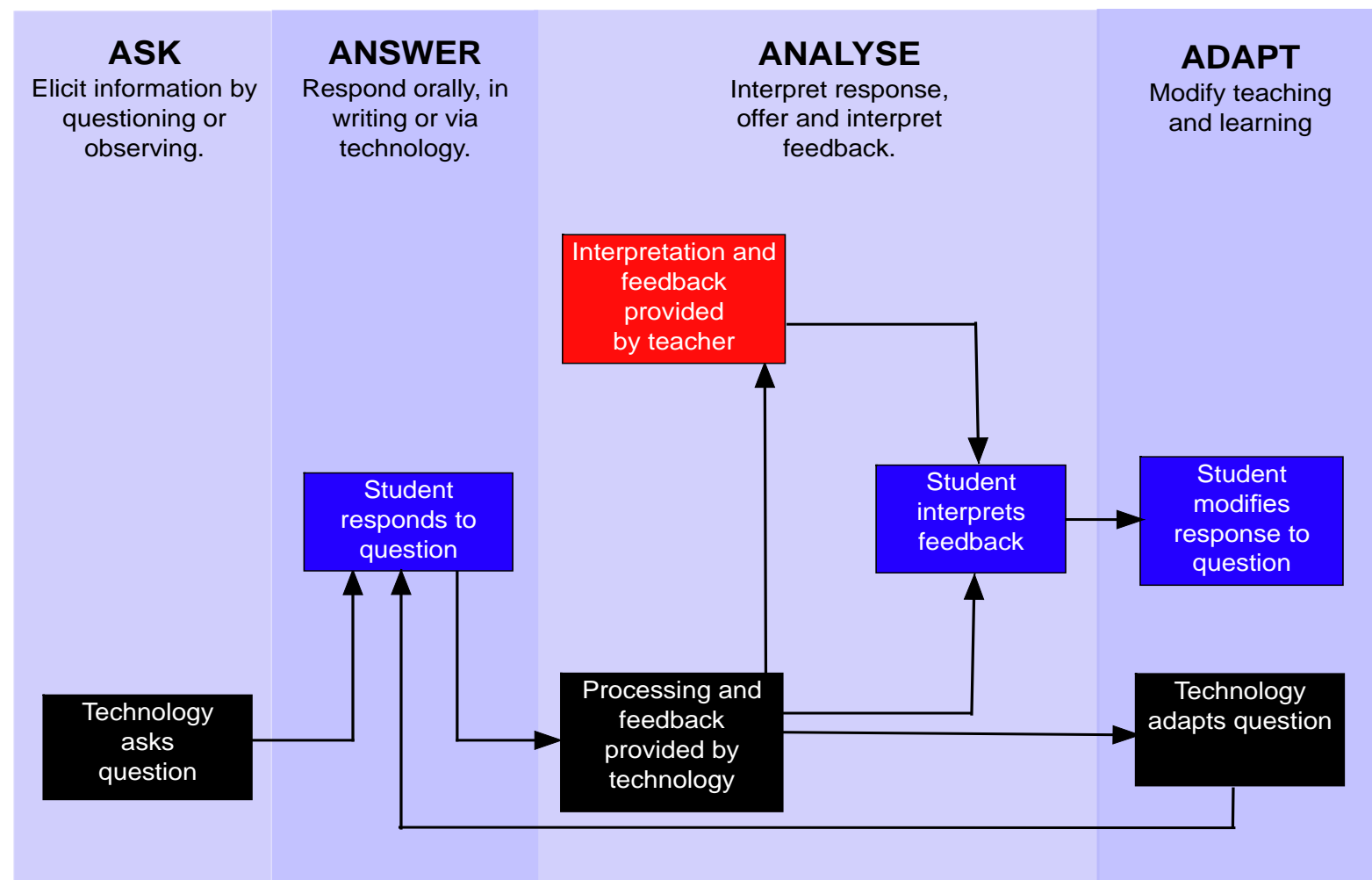
The teacher sends a question to the students electronically – the students work individually, record their solutions, with their working, on their iPads and send these electronically to the teacher – the teacher displays a sample student response and asks the class to comment on the solution - the students provide feedback on the sample student response. The teacher may also provide feedback. The student interprets this and is challenged to rethink their solution.

EXAMPLE 3



Multiple-choice questions are written by the teacher and sent electronically to the students prior to the lesson – the students send their responses back electronically – the computer marks the student work and processes the class set of responses – the computer provides feedback to the teacher in the form of a visual summary of the correct and incorrect responses to each question for the whole class (e.g. bar chart) – the teacher interprets this information and adjusts their lesson plan to focus on the areas of conceptual understanding that are highlighted as requiring development.

EXAMPLE 4



The technology generates a series of questions that have not been directly selected or written by the teacher - students respond individually - students record their responses on the computer - the technology processes each response and sends back a cumulative summary to the teacher that they can access at time to gain an overview of progress at that instant. The technology also provides feedback to the student on each question as they complete it and adapts the next question, making it easier or harder depending on the response elicited. This cycle is repeated.



Thank You!

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