

IF AT!! Immediate Feedback Assessment Technique in Undergraduate Course Review Settings

In the perpetual world of education, innovative teaching methodologies can be influential in engaging students and promoting a deeper understanding of the subject matter. Immediate Feedback Assessment Technique (IF AT) is a teaching method designed to create an engaging and interactive learning environment in which a special “scratch-and-win” style scoring card, developed by Mike Epstein at Rider University, is utilized in a group exercise. This method can be modified to suit any course material including graduate and undergraduate students. We were interested in exploring student learning in game-based review settings. We used this approach for two undergraduate courses, Introduction to Soil Science and Introduction to Earth Sciences.

IF AT is a game-based learning approach where students assess their knowledge and receive immediate feedback in the form of rewards (i.e., points). The points are represented on the IF AT card in the form of stars. The number of points awarded for each question is dependent on how many incorrect attempts are made before uncovering a star representing the correct answer. The more stars uncovered on the first attempt, the higher the points awarded. This motivates students to learn the concepts and aim for higher rewards. Students find it quite exciting, competing while holding up the surprise element.

How the IF AT method works: Students are divided into small groups (5 to 6 members) randomly. Each group is supplied with a printed questionnaire handout (Fig 1.) with a set of 10 to 15 questions, multiple-choice answers, and an IF AT card (Fig 2). The IF AT card contains the same set of multiple-choice answer options in the form of A), B), C), and D) with boxes covered with an opaque silver patch for each question. A star indicates the correct answer choice for each question, and the questionnaires must be prepared to correspond to the location of the stars on the IF-AT card. The IF AT card is similar to a scratch-off lottery ticket. Decremental scoring is used to encourage students to continue discussing till they find the correct answer if the star is not uncovered on the first attempt. An example of the IF AT card and the questionnaire used in a soil class is shown in Fig. 2 below.

Figure 1. A questionnaire with multiple choices answers for an Immediate Feedback Assessment Technique (IF AT)

Soil Science Chapter Learning Assessment
Environmental Science Class Fall, 2023

1. In an ideal condition, soil composition by volume would be
 - a) 25% solids, 50 % air, 25% water
 - b) 25% solids, 25% air, 50 % water
 - c) 50% solids, 25% air, 25% water
 - d) None of the above

2. Soil color is an indicator of
 - a) Toxicity
 - b) Groundwater
 - c) Minerals
 - d) Microbes

3. Soil Forming Factors are
 - a) Climate, Organisms
 - b) Relief, Parent material, Time
 - c) a) plus b)
 - d) Only b

4. Which of the following is an ideal soil structure for growing healthy crops
 - a) Platy
 - b) Granular
 - c) Blocky
 - d) Prismatic

5. According to USDA, and NRCS, Soil taxonomy has ____ Soil orders
 - a) 10
 - b) 11
 - c) 13
 - d) 12

6. From top to bottom, which are the layers of soil?
 - a) topsoil, subsoil, parent material, bedrock
 - b) bedrock, parent material, subsoil, topsoil
 - c) topsoil, bedrock, subsoil, parent material
 - d) parent material, subsoil, bedrock, topsoil

7. The process of formation of soil is called
 - a) Pedogenesis
 - b) Lithogenesis

Figure 2. An IF AT card with multiple choice answers A, B, C, D, and scores column
Figure 3. Students engaged in discussion and enjoying scratching the IF AT card

IMMEDIATE FEEDBACK ASSESSMENT TECHNIQUE (IF AT®)					
Name _____		Test # _____			
Subject _____		Total _____			
SCRATCH OFF COVERING TO EXPOSE ANSWER					
	A	B	C	D	Score
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5
2.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5
4.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	5
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—
10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—

Fig 2. An IF AT card with multiple choice answers A, B, C, D and scores column



Fig 3. Students engaged in serious discussion while scratching the IF AT card

Students are encouraged to debate and defend their choice of the potential correct answers from the options in the handout. Once a decision is made, one member within the group gets the opportunity to scratch off the silver opaque patch covering the option corresponding to the right answer based on their guess on the IF AT card. IF AT introduces a unique reward system. If the student guesses correctly on their first attempt and their scratched item number reveals a star, they receive 5 points. However, if their first guess is incorrect, they can make a second attempt but they receive a reduced score (e.g., 4 points) and so on. The instructor should make sure that every student within the group gets an opportunity to scratch the card for the right answer to win a star. This allows students to challenge themselves and encourages them to try again to win more stars. The IF AT cards can be purchased from <https://www.cognalearn.com/ifat>.

This method is found to be effective because students can learn easy as well as difficult concepts while having fun. They find scratching off numbers to discover the right answers enjoyable. This method is unique and allows engaging in discussion and collective decision-making. It is unlike any other ordinary quiz where students simply choose the correct answer with no surprise (winning a star) making it uninteresting. The intent to score more points (stars) allows them to keep trying. It is important to encourage all students to give input into the decision-making process. At the outset, the more extroverted students sometimes control the decision-making process; however, if students are encouraged to explain and defend their choice of the correct answer, it is more likely that the group will be successful in determining the correct answer. Methodology resulted in above 95% success rate in student learning. This method can also be used by an instructor to get feedback on their performance in a classroom from their students.

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