

A case study of the formative use of assessment information in secondary science subjects in Greece

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Schedule



Introduction

- *Educational Assessment*

Assessment is defined as the process of firstly gathering evidence, and secondly interpreting that evidence in the light of some defined criterion in order to form a judgement.

(Harlen, 1994, cited in Isaacs et al., 2013)

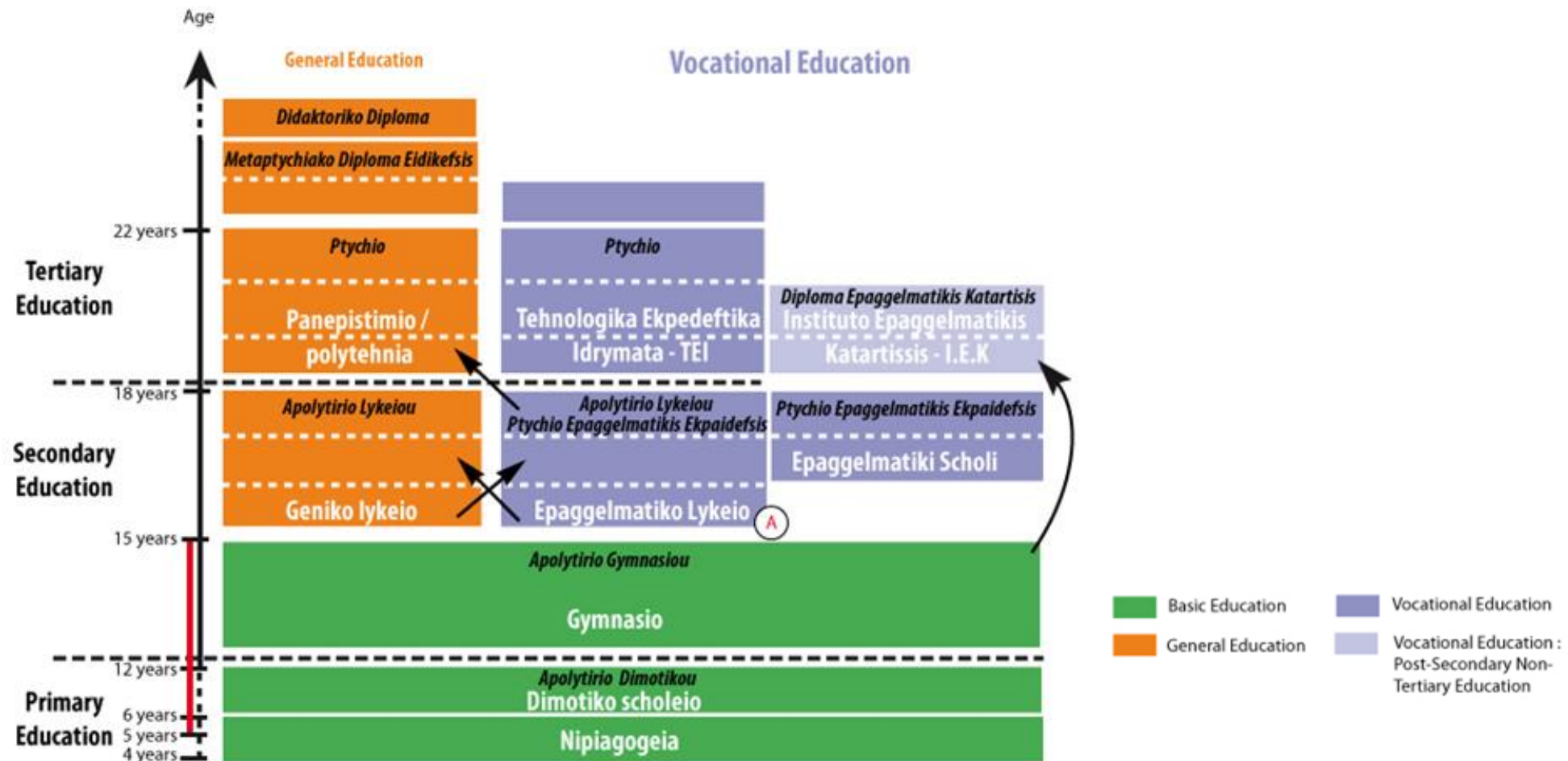
Uses of assessment information:

- formative uses (assessment for learning),
- summative uses (assessment of learning),
- evaluative uses (assessment for accountability) and
- diagnostic uses (assessment for special intervention)

(Task Group on Assessment and Testing in England, 1988)

Research focus

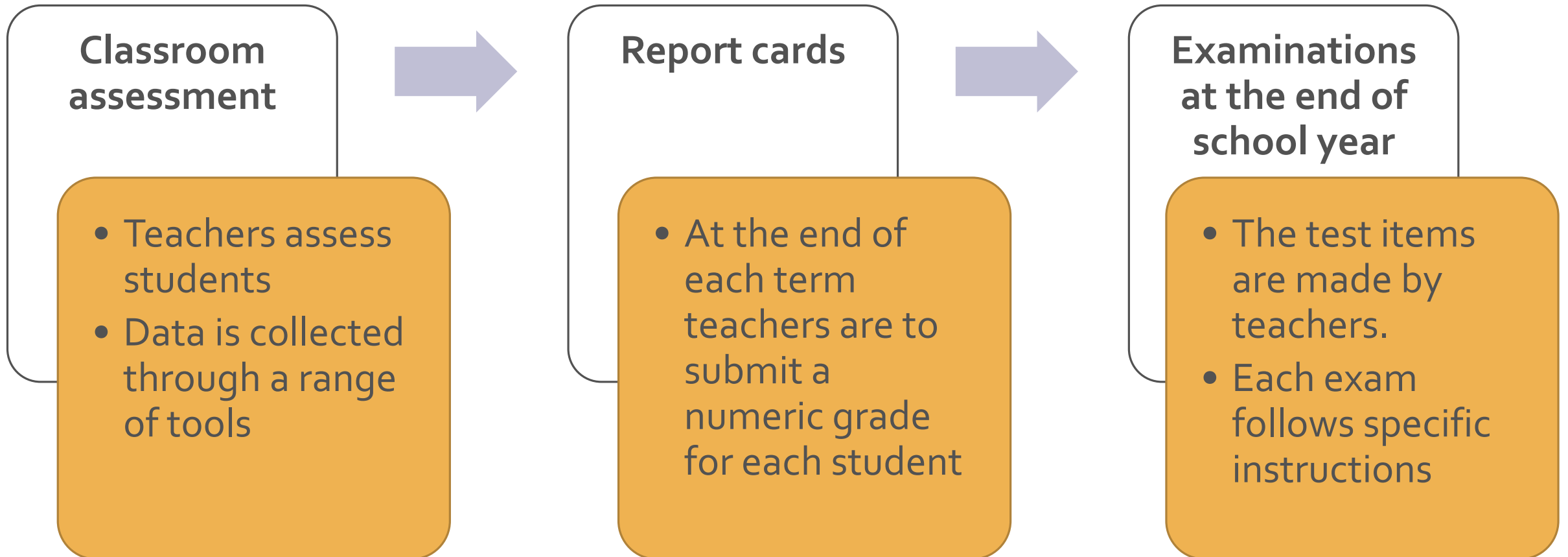
- Greek Educational System



(source: onicep, 2014)

Research focus

- *Assessment policy in Greek secondary education*



Research questions

- What formative use of assessment information do science teachers apply in secondary schools in Greece on a day-to-day basis?
- What are teachers' perspectives on their own practices?
- How do these practices reflect on the principles of FA?



Literature Review

- *What is FA?*

*An assessment functions **formatively** to the extent that evidence about student achievement is elicited, interpreted, and **used by teachers, learners, or their peers**, to make decisions about the next steps in instruction that are likely to be better, or better founded, than **the decisions** they would have taken in the absence of that evidence.*

(William, 2011, p. 43)

Literature Review

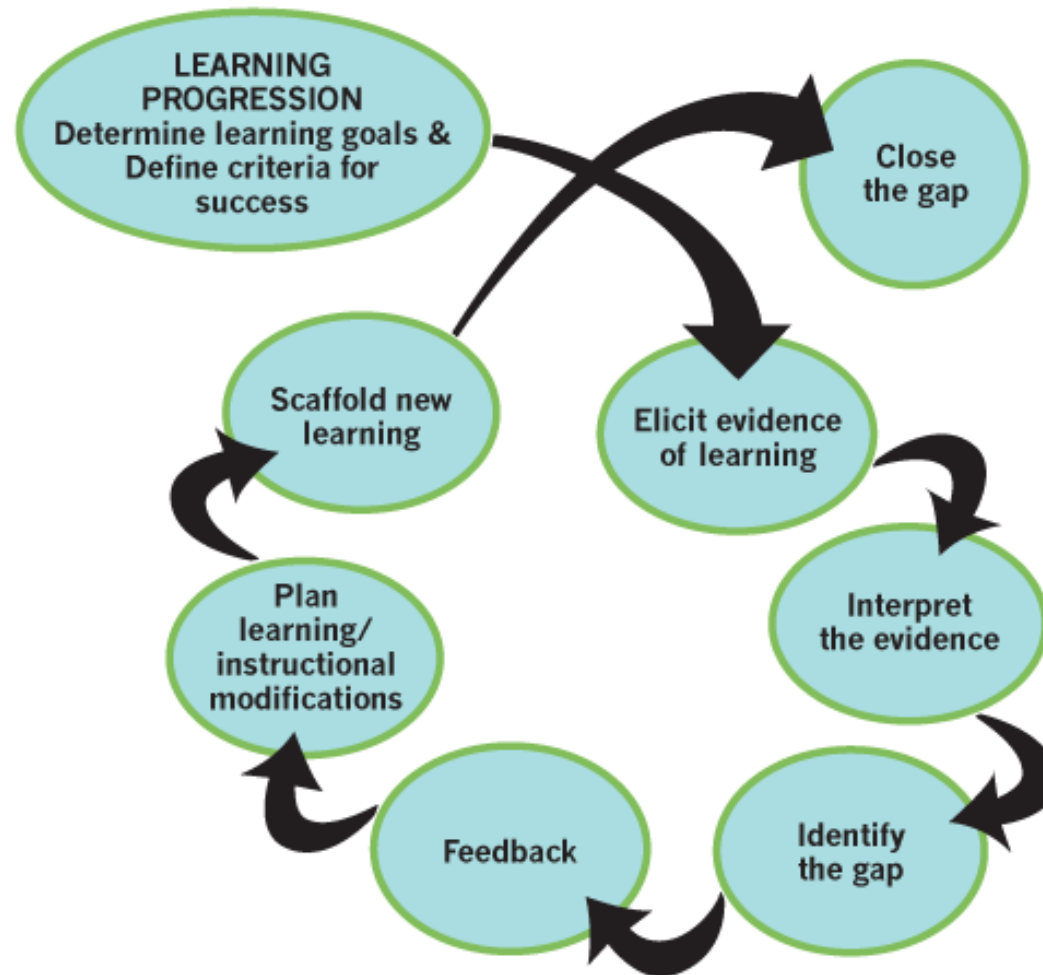
- *Processes, roles and strategies of FA*

	Where the learner is going	Where the learner is right now	How to get there
Teacher	Clarifying and sharing learning intentions and criteria for success	Engineering effective classroom discussions, activities, and tasks that elicit evidence of learning	Providing feedback that moves learning forward
Peer	Understanding and sharing learning intentions and criteria for success	Activating learners as instructional resources for one another	
Learner	Understanding learning intentions and criteria for success	Activating learners as the owners of their own learning	

(Leahy et al., 2005)

Literature Review

- *Processes, roles and strategies of FA*



(Source: DataUse web site, 2015)

Literature Review

- *Questioning, dialogue and feedback in science education*

The purpose of questioning should be to investigate pupils' ideas and misconceptions and promote their thinking (Black and Harrison, 2004).

Classroom dialogue encourages students to clarify, compare, challenge and defend their various views using evidence that can also be subject to critique (Cowie, 2013).

Student feedback helps them to modify their thinking to the scientifically accepted concepts (Bell and Cowie, 2001).

Methodology & Research methods

Research design Qualitative research

Case study approach

Methodology & Research methods

Sampling

Type:

convenience

Size:

five Greek science teachers

Teaching experience of participants:

- two have 4-6 years
- two have 10-12 years
- one has over 22 years

Type of school:

- one public school
- three private schools

Instructional level:

- one worked in Gymnasium
- one in Lyceum
- three worked in both in stages.

Methodology & Research methods

Data collection

Observations

- Each participant was observed only once
- Semi-structured observations
- The researcher was non-participant observer
- Descriptive notes were kept on an observation sheet

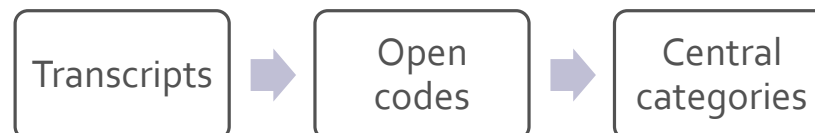
Interviews

- Semi-structured interviews
- Two parts of open-questions
- A voice recorder was used
- Field notes were kept

Data analysis

Based on Grounded Theory

Analysis process



Methodology & Research methods

Ethical issues

- British Ethical Research Association (BERA, 2011)

- British Sociological Association (BSA, 2002)

Limitations

-The sample size

-Only one observation per participant

-No time for participants to reflect on questions

-Students were not included in the research

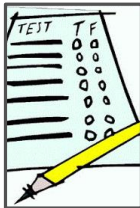
Data analysis & Discussion

- Main categories

- Teachers' conceptions about the purpose of their assessment practices
- Teachers' perspectives on classroom assessment practices



Questioning



Quizzes



Assessment
worksheets



Practical work



Feedback



Instructional
modification

Data analysis and discussion

- *Purpose of classroom assessment practices*

Monitor students' achievements-
Collect grades

Check students' preparation

Check students' attention to the lesson

Evaluate students' knowledge and understanding

Motivate students for higher achievements

Force students to study frequently

Evaluate the transmission of the lessons

Adjust their teaching

Data analysis and discussion

- *Purpose of classroom assessment practices*

- ✓ Evaluation and adjusting instructional activities are the main principles of FA.
- Students' preparation put the focus on recalling information or terms, and not on seeking information about the students' understanding and thinking.
- Summative purposes dominate formative purposes.
- Grades do not always have a beneficial effect on student motivation, or may not provide intrinsic motivation that is important for lifelong learning.

Data analysis & Discussion

- Sharing learning objectives

- Not a common practice across participants
 - Making learning objectives and success criteria explicit to students is an essential strategy in FA.
 - Learning objectives should also be the basis for other practices, such as feedback and self and peer-assessment.

Data analysis & Discussion

- *Eliciting evidence of learning*

Questioning

- The most common assessment practice used among the participants
- Teachers separated questions into two groups:
 - Beginning of the lesson/ oral tests
 - During the lesson and used more formatively
- In the majority of lessons observed, only few students participated and there was no waiting time for student responses.
- The forms of questioning used varied and most were closed
 - ★ However, most expressed the importance to keep a balance between open and closed questions.

Data analysis & Discussion

- *Eliciting evidence of learning*

Questioning

- ❖ Information gathered through questioning is not recognised by teachers as having a potentially formative function.
- ❖ Lack of waiting-time discourages pupils from even trying to think of a response.
- ❖ Classroom dialogue was not a common practice.
 - As Black and Wiliam (2010) argue when teachers put the emphasis on dialogue, rather than on the current answers, teachers can achieve a free-flowing exchange of ideas and elicit evidence of learning from more students.

Data analysis & Discussion

- *Eliciting evidence of learning*

Quizzes

- Include open and/or closed questions
- Assignment completed in 20 minutes or less
- Used when teachers wanted to assess all students
- Quizzes are used mainly for summative purposes
- Students were highly anxious about quizzes
 - ❖ Teachers noted about students' anxiety that students related quizzes to the final examinations

Data analysis & Discussion

- *Eliciting evidence of learning*

Assessment worksheets

- Refer to a few questions for students to fill in at the end of the lesson
- The use of assessment information vary among participants:
 - outcomes used for adjusting the following lesson
 - used for summative purposes if they were positive
 - used to check student attendance in class
- Teachers can gain feedback information on student learning in large classes (Nicol and Macfarlane-Dick ,2006)
- The idea of checking attendance reflects the behaviourist view of learning (Stobart, 2008)

Data analysis & Discussion

- *Eliciting evidence of learning*

Practical work

- The majority of participants used practical work to assess:
 - students' practical skills
 - distinguish between the understanding and memorization of scientific concepts
- As Harlen (2007) notes, practical work allows teachers to gather rich evidence of students' ideas, skills and thinking
- Abrahams, Reiss and Sharpe (2013) argue, there is a lack of clarity in assessment for practical skills in school science

Data analysis & Discussion

- *Feedback*

Oral response to students' answers

- Each teacher provided oral feedback in a variety of ways:
 - correcting wrong answers
 - asking other students to give the correct answer when a student was struggling
 - collecting answers from different students and then formed the final answer
 - asking questions back to the students
- In most observed lessons teachers praised students and their work
- Most participants appeared skeptical about the effectiveness of their oral feedback

Data analysis & Discussion

- *Feedback*

Written comments on students' assessments

- All participants grade students' work on quizzes, but a few gave written comments
- Type of comments:
 - underlined the weaknesses in the students' answers or wrote model answers
 - personalized comments for each student
- All participants believe that scores and grades promote student learning when students understand why they gained a particular grade

Data analysis & Discussion

- *Feedback*

- Corrective feedback focuses only on the quality of student answers, rather than giving directions about where they should go next and how best to get there (Stobart, 2012).
- Grades appear to downgrade the value of feedback as students rarely look beyond the grades (Black and Wiliam, 2010)
- Praise has little impact on learning
 - it focuses on the students' ego, rather than on the task and the learning objectives (Black et al., 2003; Hattie, 2008)
 - it is also related to social comparison with peers (Earl, 2013)

Data analysis & Discussion

- Instructional modification

- All participants shared that they use the eliciting evidence of student understanding to adjust their current or next lesson, if necessary
- Many appeared to adjust their lessons re-teaching the learning objectives
 - Re-teaching the lesson is not a panacea for all student errors
 - Effective FA requires quality inferences and instructional adjustments
 - Teachers should understand the differences between errors – such as slips, misconceptions and a lack of understanding – and adapt the proper instructional action (Bennett, 2011)

Data analysis & Discussion

- Teacher's and student's role in the assessment process

Teacher's role

- responsible for student understanding
- gather evidence of students learning
- give mainly quantitative feedback
- adjust their subsequent teaching

Student's role

- learn when listening
- learn through mistakes on assessments

- Teachers appear to have a dominant role in the assessment process, while the students' role was more passive
- Teacher-led assessment process does not promote student metacognitive skills, self-regulation, motivation and learning autonomy (James et al., 2007)
- Comparisons among subject teachers show that science and maths teachers adapt a more 'delivery'-focused teaching approach (Black et al., 2003)

Summary

- ✓ The participants used some FA strategies that are important in promoting student learning.
- Participants' approaches were more teacher-directed and students appeared not to have any role in the assessment process.
- Feedback practices on student assessment to bridge the gap in student learning appeared weak.

Recommendation

- Policy makers should include FA principles in assessment policy
 - utilize examples from countries where FA is embedded into the national curriculum
 - incorporate teachers' professional-development materials (Heritage, 2013)
- It is essential for teachers to understand the different purposes of assessment and work towards achieving a fine balance between FA and SA, rather than opting for one or the other

Thank you for your attention!



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