



Combining formative and summative use of assessment

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What's the problem?

1. The educational goals in science education are constantly getting more and more ambitious, demanding advanced professional and generic competences.
2. We know a lot about how to teach for these (new) competences (for instance through many FP7 projects), but
3. The predominant assessment methods used for summative purposes are not able to capture these new goals.
4. The assessment forms have a deciding influence on teaching.
5. 'Traditional' assessment forms will encourage 'traditional' teaching so most existing summative assessment and evaluation forms are blocking for teaching that makes it possible for students to acquire the new learning goals.
6. The summative culture (accountability, competing for marks etc.) is distorting the learning culture – promoting a performance motivation among students at the expense of mastering.

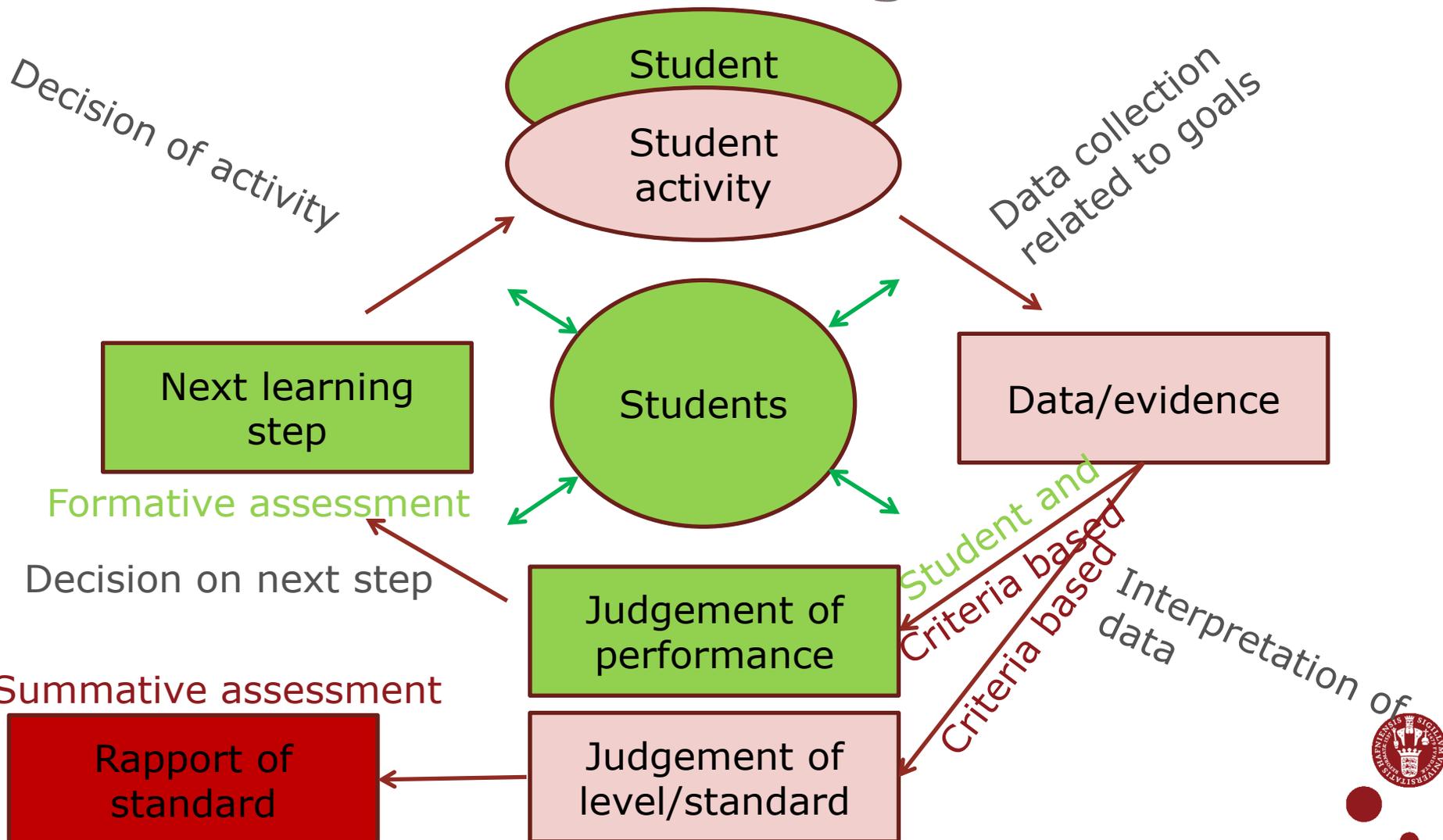
Two possible solutions:

1. Develop more valid assessment methods suitable for summative purposes
2. Combine the formative and summative use of assessments (RQ3)



Formative and summative assessment (based on Wynne 2013)

Achievement goal



Formative-summative continuum?

Formative<----->Summative				
	Informal formative	Formal formative	Informal summative	Formal summative
Major focus	What are the next steps in learning?		What has been achieved to date?	
Purpose	To inform next steps in learning	To inform next steps in learning and teaching	To monitor progress against plans	To record achievements of individuals
How is evidence collected	As normal part of class work	Introduced into normal class work	Introduced as a special part of normal class work	Separate task or test
Basis of judgement	Student- and criterion-referenced	Student and criterion-referenced	criterion- and student-referenced	Criterion-referenced

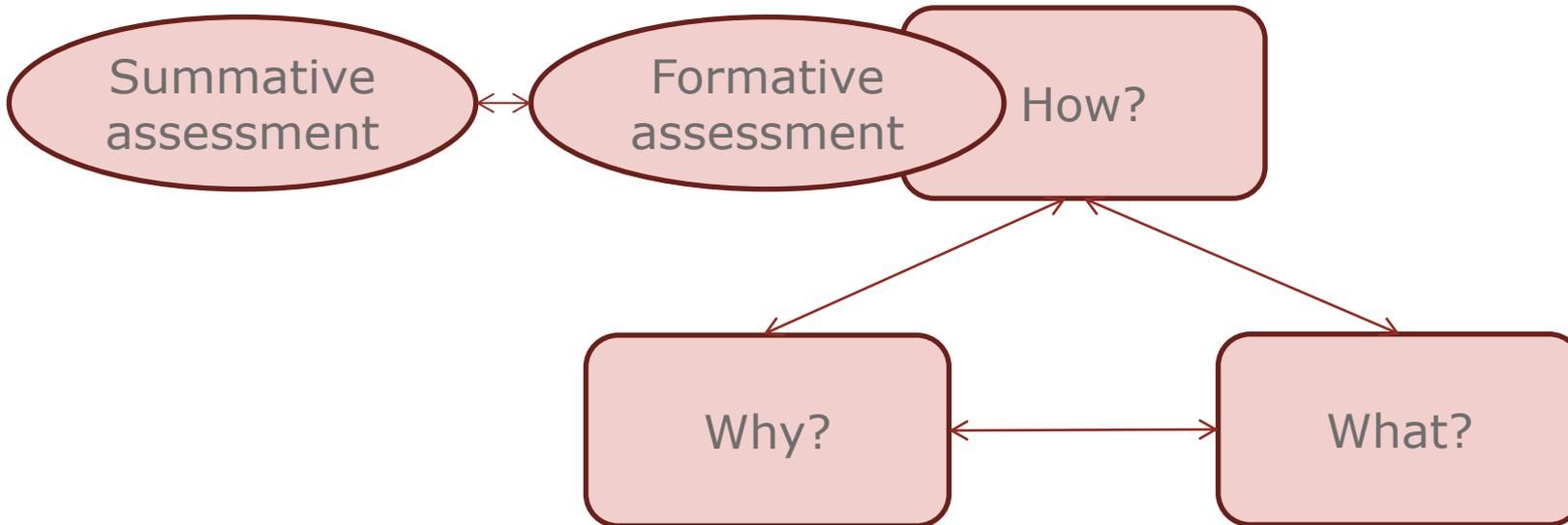


(Harlen 2013)

Assessing experimental competences summatively

How can we assess student's experimental competencies in a valid and reliable way – without distorting the everyday teaching and learning?

How can you teach experimental science that fulfils the intended learning goals?



What are the main goals of experimental science?

How can we describe experimental science as an integral part of science education?



For formative assessments to be used summatively, they need to be performed stringent and reliably. This will imply/cause a strong goal-orientation of the teaching – which will change the classroom for good and bad.

It also requires an organisation and implementation that does not violate the students' premises for their work and their engagement – the didactical contract.



Various solutions

End of the year examination

Students put in a semi authentic situation and given a fixed time span (4 hours – 8 hours – 24 - 48 hours) to go through (most of) the inquiry (including experimental) framework. The work is monitored and assessed and supplemented with an individual oral examination (with external examiner).

The examination replicates everyday teaching (like many Danish science examinations)

Integrated assessment system

- Summative assessment as multiple assessment events distributed across the school year and aggregated together for accountability purposes.
- Formative assessment as componential item sets; classroom tasks; extended activities; and teacher guides and interpretive materials.

The summative assessment is distinct activities during the school year (like the CBAL project)

Flexible platform

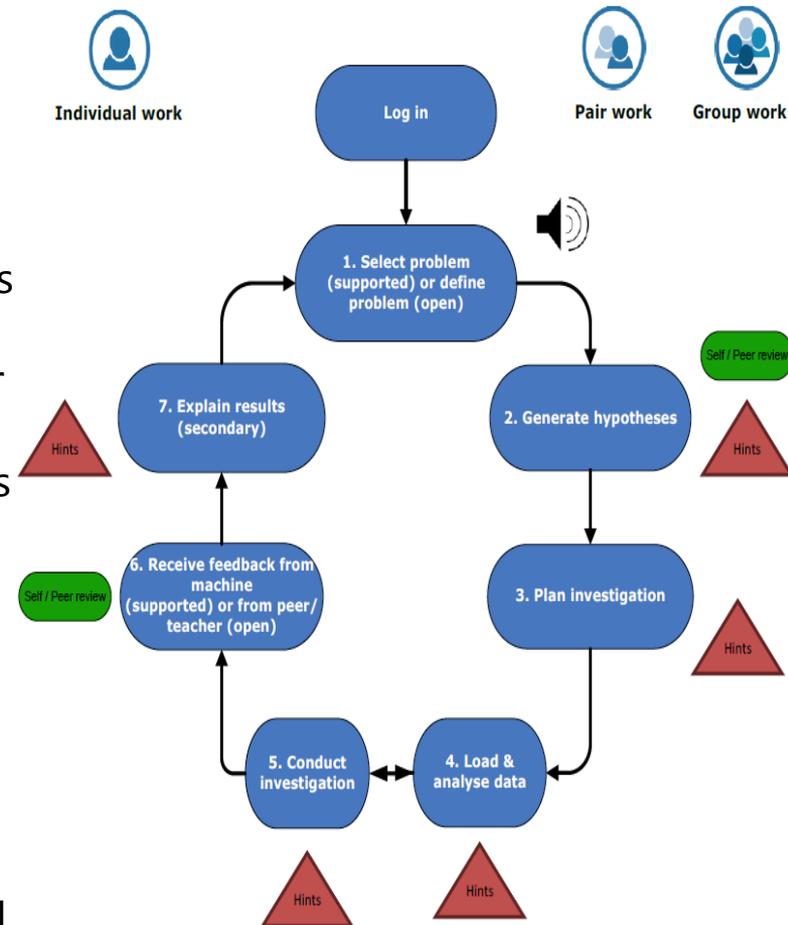


Figure 5: Online investigation lab learning journey

The summative assessment is continuously happening during the school year (like the ASSIST-ME platform)



Questions

Is it *possible* to combine formative and summative use of assessment? (how?)
Is it *desirable* to try to combine formative and summative assessment? (problems?)



KCL, FH, USB, UCPH answers to questions for last LWG meetings

1a Is it desirable to try to combine formative and summative assessment?

KCL: Teachers seem to be receptive to use evidence collected through formative assessment for summative judgements, and demonstrated an ability to use their formative evidence from assessment conversations to make a summative judgement in relation to inquiry competences

USB: I think that combination of these two types is the best option. possible to use the formative assessment for summative purposes

FN: not possible juristically. must be clearly communicated to the students. Peer-assessment is not considered very reliable. FA and SA are traditionally not combined in Switzerland. cantonal guidelines which prohibit the use of information collected for formative purposes in grades. in typical teaching practice, the information from FA is no more relevant at the time when the grades are given. the criteria used for FA and SA are not the same.

UCPH: Long tradition for mixing the two – but many ethical considerations



1b How can you make sure that the teacher's judgment in a formative assessment is reliable enough to be used summatively?

KCL: Teachers have confidence in their professional judgement. The evidence collected through their formative assessment practice enables teachers to predict to a certain extent how students will perform on summative tests. Teachers are interested in developing strategies to collect evidence from formative assessment in a systematic way.

Teachers have put several strategies forward. Reliability comes from having explicit success criteria and drawing from evidence

FN: the criteria, or at least the weighting of the criteria is different between students. Formal formative assessment (rubric with same criteria for everyone, written form) is just as reliable as summative assessment when provided by the teacher and not the peers. Peer-assessment is not considered very reliable by the students.

UCPH: You can't. Some teachers give quite random assessments while others use tests formatively.



1c What are the pros and cons of assessing students formatively by conducting a series of summative tests?

KCL: evidence collected summatively can be used to adjust teaching tailored to individual needs. The assessment conversations that take place as the inquiry unfolds provide a rich-bed of learning evidence that supports responsive teaching. Teachers are very positive on the benefits of formative assessment in real-time. cons: Teachers are wary of giving too many grades to students and summative tests often are associated with grades.

USB: I can't imagine that series of summative tests. It could mean you will write the series of common tests in the Math and during that series you will work with them formatively. I can see that the students reached some level so I could continue with the other test.

1d What are the pros and cons of the formative assessment becoming more formalized if the informations gathered about the students are to be used summatively?

USB: All of us learn it – the students as well as the teachers. I would start with easier concrete guiding questions and then continue to more difficult levels. it is necessary to lead the students. the problem is that all students are not able to keep on the track with the selected criterions.

UCPH: Makes it easier for the teacher and the student to assess reliable. But it is time consuming.

