

Recommendations from the policy experimentation



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Contents

| | |
|---|---|
| 3 | The challenge |
| 3 | Digital formative assessment |
| 3 | The solution developed |
| 5 | The experiment |
| 6 | Country and Student Dialogue Labs |
| 6 | Key findings |
| 7 | What was learned from Assess@Learning? |
| 9 | References |



An online systemic toolkit to support teachers' knowledge and adoption of digital formative assessment

The challenge

When seeking to improve their practice, what teachers observe about students' learning is one of the most effective ways of improving education (Black & William, 2018). They work closely with their students and so are well placed to know which innovative practices would work best. Formative assessment practices enable teachers to become more efficient in identifying students' needs, personalise teaching and empower students to reflect on their learning.

The first challenge is that, despite its benefits (Lee et al., 2020), formative assessment is not widely adopted in education systems. Across OECD countries, only 58% of teachers provide written feedback to students and 41% engage them in self-assessment (OECD, 2019). When formative assessment is adopted, misconceptions can arise among teachers (McEntarffer, 2021). For example, formative assessment for some means low stakes, non-graded tests; for others, it is monthly tests to identify students who are struggling. Both perceptions are partially right: even if a test is non-graded, it is not being used formatively if teachers are not using it to give feedback to students or to adapt their own teaching. Frequent testing to identify struggling students involves elements of formative assessment, but other interventions are possible during a lesson or between lessons to empower students in their learning (e.g., asking them to assess their peers or develop their own assessment criteria).

A second challenge is the difficulty for some teachers and school leaders to change habits and try something new, despite knowing that it could help improve their practice. Decades of research on habits indicate that education professionals are resistant to interventions targeting attitudes (Verplanken & Orbell, 2022). Trying a new practice demands an effort to disengage from routine practices and time to investigate and prepare. Therefore, a systemic change in attitude and support from education stakeholders (policy makers, school leaders and parents/guardians and students) can foster the adoption of new formative assessment practices.

Third, the potential of digital tools remains largely untapped. Computer-mediated formative assessment can be beneficial for students (Li et al.; 2019), for instance, by offering different modes of assessment and giving feedback.

Pre-pandemic international data showed that few teachers regularly used digital tools that can enhance formative assessment (Fraillon et al., 2020): Only 11% used classroom polling tools, 28% learning management systems, 7% concept maps and 7% digital portfolios. Moreover, although the use of digital tools increased after the outbreak of COVID-19, they are not necessarily being used for digital formative assessment. In fact, a range of surveys and evaluations have found that most teachers tend to use new technologies to reinforce traditional approaches to learning and assessment (Langworthy et al, 2010; Selwyn, 2010). Therefore, there is still room for adopting more meaningful uses of digital tools in assessment. Digital portfolios, classroom polls, concept maps and communication software can inspire teachers to prepare activities that help them understand students' learning better and engage them in self-regulation and peer and self-assessment.

Digital formative assessment

Digital formative assessment (DFA) includes all features of the digital learning environment that support assessment of student progress and which provide information to be used as feedback to modify the teaching and learning activities in which students are engaged. Assessment becomes 'formative' when evidence of learning is actually used by teachers and students to adapt next steps in the learning process (Looney, 2019).

The solution developed

Overcoming the challenges related to digital formative assessment (DFA) can only happen systemically, by working on all the levers of change in concert and involving all the main actors concerned in chains of collaboration: policy makers, school leaders, teachers, students and parents/guardians.

To this end the [Assess@Learning](#) policy experimentation project developed an online systemic DFA [toolkit](#) targeting these five education stakeholders with the aim of increasing the readiness to implement DFA both at policy and practice level. For instance, the toolkit offered examples of practice both for teachers who are new to DFA and for those who are experienced and want to further diversify their repertoire of practices. The toolkit also offered school leaders a toolbox for planning actions to support DFA in their school. It also provided guidance for policy makers, e.g., on digital infrastructure, considering the ethics of using digital tools, integrating summative and formative assessment.

The toolkit is the result of a co-construction process involving teachers, experts and project partners representing education systems with different governance models. From the very start of the project, a literature review was originally conducted to map a wide range of DFA practices and inform the toolkit development process. After development, the toolkit was reviewed by three experienced teachers and an expert in formative assessment.

The toolkit (Figure 1) consisted of:

- An introduction to DFA – Introductory pages for each target group (school leaders, teachers, students, parents and policy makers) to raise awareness of their role in DFA, introduce what

DFA is and present inspiring ideas and good practices. The pages were designed in a light, storytelling style, making use of interview videos, animations, infographics and cartoons.

- 23 teaching scenarios: The scenarios were collected from seven countries and illustrate how the teacher used formative assessment in their own classroom and subject. To appeal to both teachers with high and low experience with DFA, scenarios are of varying complexity levels and made use of different digital tools.
- 15 case studies: Intended to inspire school leaders and policy makers, the case studies were collected from eight countries and explain how school leaders, policy makers and researchers support DFA practices in their own context.
- The School Positive Change Toolbox - As a way to support school level integration of digital formative assessment, the toolkit includes guidelines to help school leaders define their goals and how to achieve them, as well as to describe the potential impact and risks of their plan.
- A pedagogical and digital glossary – The glossaries give the definitions of concepts and digital tools mentioned throughout the toolkit.

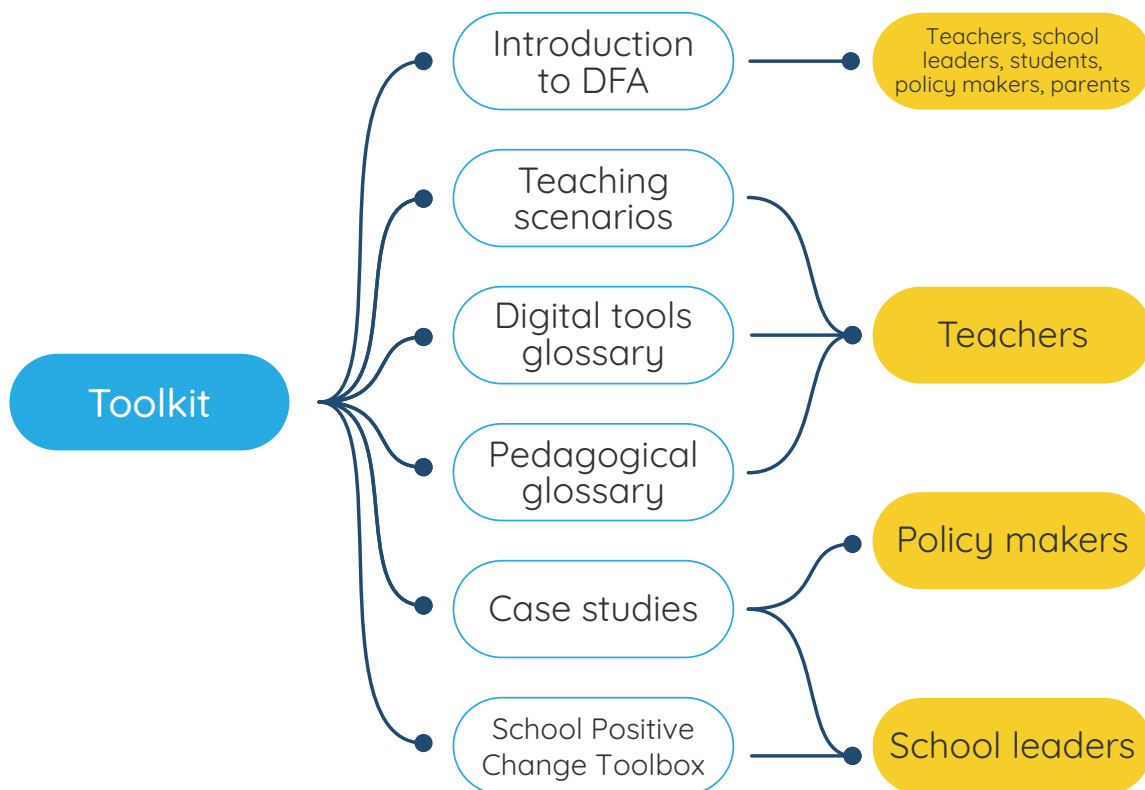


Figure 1 The toolkit structure

The experiment

The toolkit was tested to determine whether it had an impact on teachers' readiness to use DFA, on school leaders' attitude and support, and on students' attitude and experience regarding DFA. The logical framework (Figure 2) shows the set of indicators that the experiment identified to measure the impact of the toolkit.

These indicators can be summarised as:

1. Knowledge and awareness of (digital) formative assessment
2. Attitudes towards digital formative assessment
3. Use of digital formative assessment
4. Actions to support digital formative assessment.

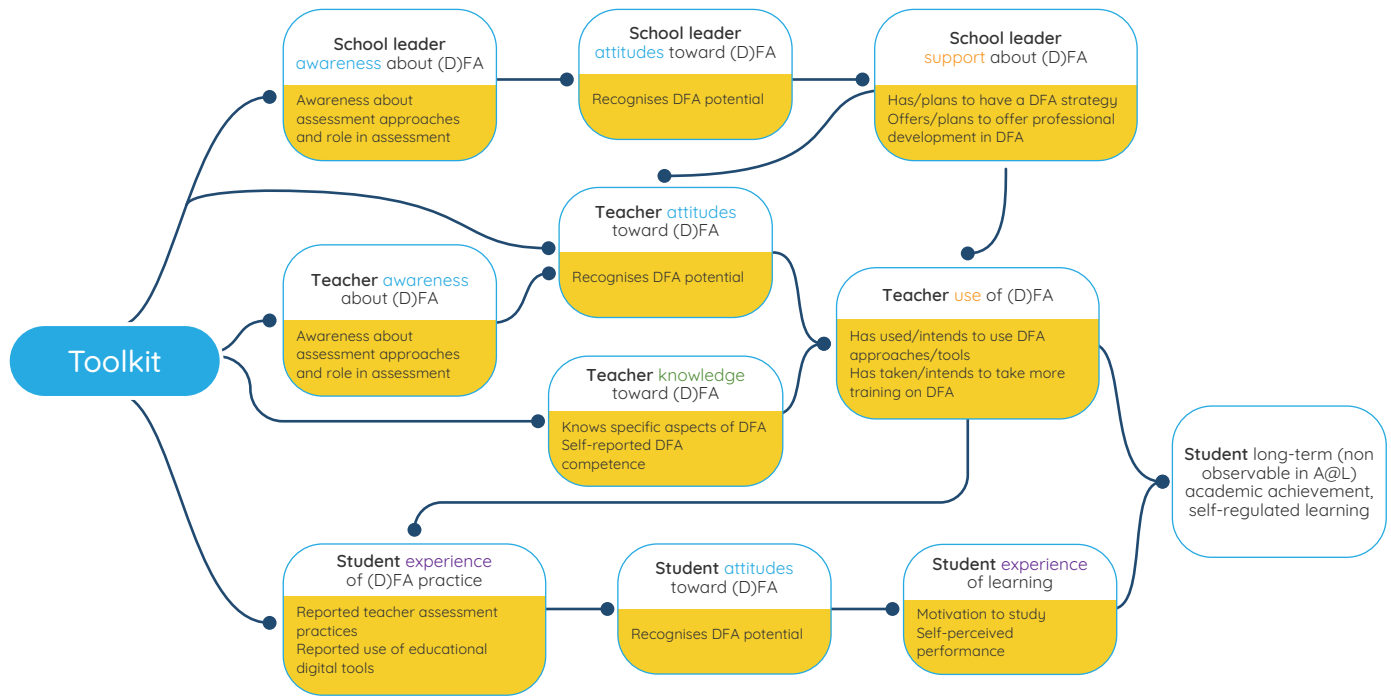


Figure 2 Assess@Learning logical framework of outcomes

The experimental setup

1. 2,391 schools from five countries (Estonia, Finland, Greece, Portugal, Spain) were randomly sampled and invited to participate. The goal was to involve 400 schools in the experiment.
2. 208 schools accepted the invitation to participate in the experiment. School leaders were asked to select teachers from their school to participate in the study. 846 teachers and 2,517 students joined the experiment.
3. Teachers, school leaders, and students filled in a baseline survey about their knowledge and views about (digital) formative assessment before joining the experiment.
4. The schools were randomly allocated to a test or control group.
5. The test group was given access to the toolkit between December 2021 and April 2022. The control group did not have access to the toolkit and was only given access to a series of six articles about assessment released monthly.
6. In May the access to the toolkit was closed and both the test and control group filled in a follow-up survey.

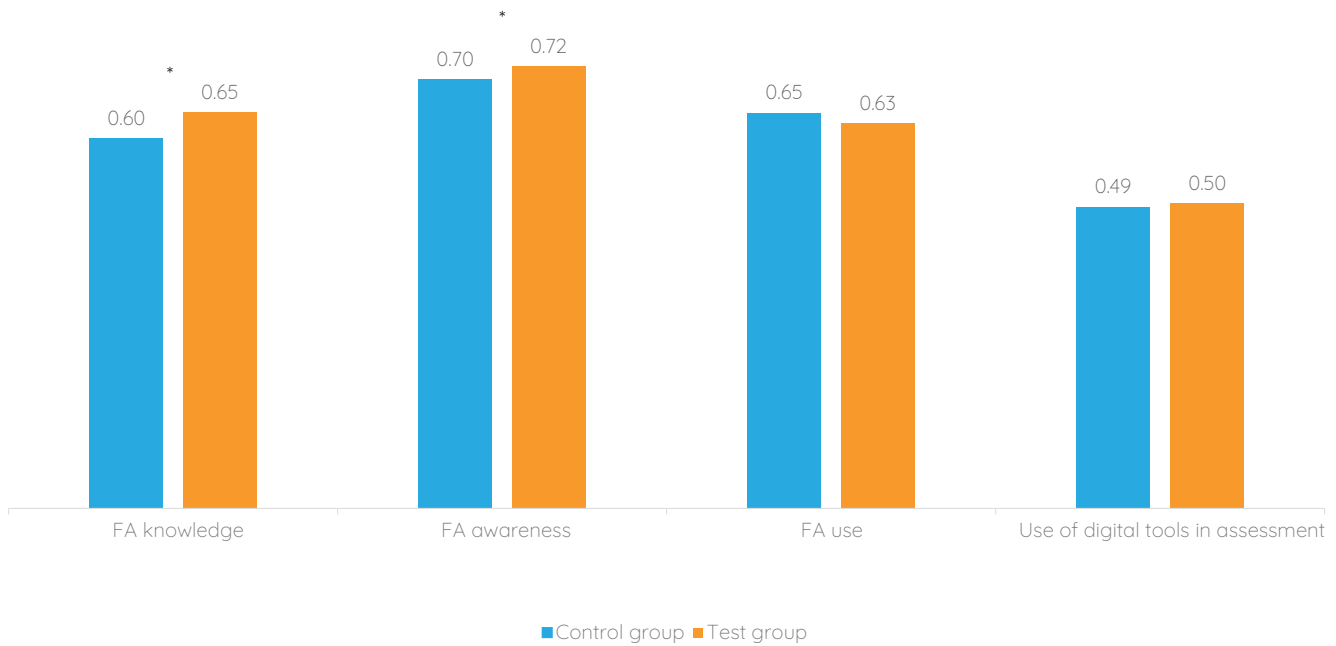


Figure 3 Overall impact of the treatment on teachers’ knowledge and awareness of formative assessment and their use of formative assessment and their use of digital tools in assessment. The asterisks indicate statistically significant differences.

Teachers, school leaders and students were asked to fill in a survey before and after joining the experiment. It asked how often and when they visited the toolkit and which pages they viewed. A summary of the results can be found below. For more details on the statistical analyses carried out, please refer to the [Technical Evaluation Report link](#) (in English).

Key findings

- 68% of teachers, 62% of school leaders, and 33% of students accessed the toolkit at least once (Figure 4). Fewer school leaders and students used the toolkit.
- The toolkit was positively rated by teachers, school leaders and students (average score of 7 out of 10). 9 out of 10 teachers said they would recommend the toolkit to a colleague.
- After using the toolkit, teachers’ knowledge of (digital) formative assessment increased significantly (Figure 3).
- There was also a slight but significant increase in the teachers’ awareness of their role in digital formative assessment after using the toolkit.
- After using the toolkit, teachers’ attitudes towards (D)FA and their use or intention to use DFA did not change.
- The findings did not reveal any impact on school leaders and students.

Country and Student Dialogue Labs

Country Dialogue Labs (CDL) and Student Dialogue Labs (SDL) constituted the qualitative research of the project, to enrich the understanding of various views on DFA and identify challenges to implementing it. Qualitative evidence from the CDLs and the SDLs complement the quantitative evidence from the analysis of the data collected during the experimental field trials. CDLs are half-day workshops that provide opportunities for knowledge sharing and dialogue – in this case on digital assessment and digital formative assessment – between education stakeholders: policy makers, school leaders, researchers, teachers, students, parent representatives, teacher trainers, local authorities and more. Three Country Dialogue Labs took place in each partner country, two before and one after the experiment, to discuss digital assessment, DFA and the results of the project. Student Dialogue Labs (SDLs) took place separately from CDLs, and were opportunities specifically for students to come together and share knowledge and dialogue about their views and experiences of digital formative assessment. This enabled us to engage with students in authentic ways, to enable them to meet other students and dialogue about digital assessment and digital formative assessment and how they experience this in real classroom contexts. The outcomes of the dialogue labs will be available in detail at the end of February 2023 on the [Project Outcomes page](#).

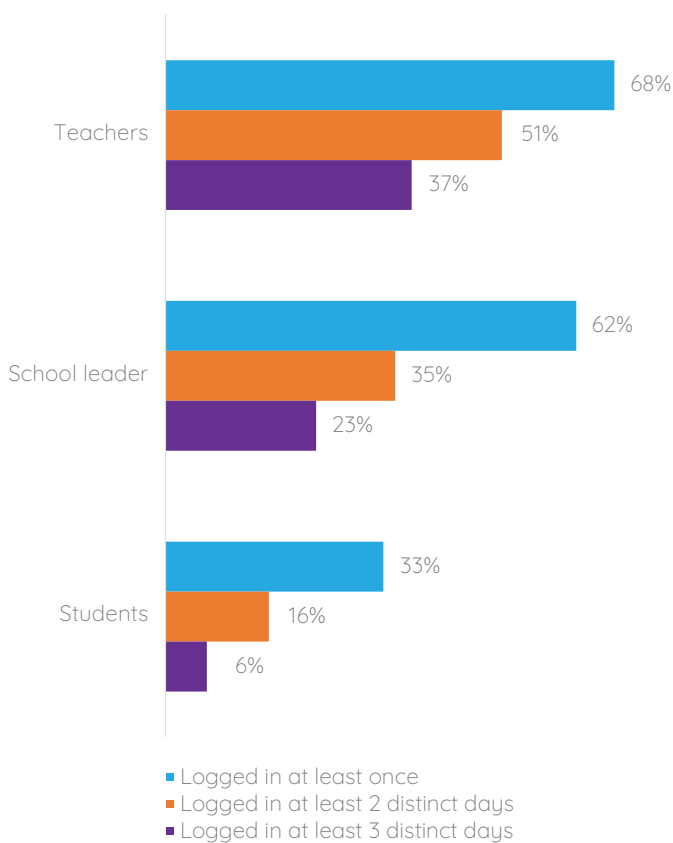


Figure 4 Intensity of toolkit use according to target groups

What was learned from Assess@Learning?

The toolkit increased teachers' knowledge of formative assessment.

Within just a few months the toolkit can help teachers to understand better what (digital) formative assessment is. Offering information about formative assessment in the form of a toolkit can be a cost-effective bottom-up way to address misconceptions concerning formative assessment in education systems.

Teachers already had a positive attitude towards digital formative assessment.

According to baseline survey results, even before joining the experiment, teachers were already familiar with formative assessment and had a positive attitude towards DFA. Their attitude did not change significantly after having access to the toolkit.

The toolkit did not lead teachers to use DFA more.

Although the teaching scenarios were designed to be relevant for teachers of varying experience with DFA, the toolkit offer did not lead to more use of DFA. This finding raises the question of the conditions required for any toolkit to be an effective method to encourage the uptake of new practices.

Teachers' attitude was already positive at baseline. Therefore, a negative attitude might not be a reason not to make use of DFA. Teachers might well know

that (D)FA can help them improve their teaching but face other challenges in implementing it, such as the school teaching organisation (time and space) and access to relevant digital resources and training. Further investigation would be useful to get a deeper understanding of these challenges and how to address them depending on the context of the teachers and schools.

With additional support and time, DFA adoption can increase.

It is possible that teachers did not implement DFA more in their practice because they did not explore the toolkit enough (Figure 3), in particular within the five-month period of the experiment that might have been too short to observe a change in practice. It could also be that the conditions were not all in place for a systemic effect (i.e., a supportive strategy and conditions at school level, time and space constraints) to induce a change of practice. The lack of mediation (i.e., promoting the existence of the toolkit and providing support in using it) might be another explanation requiring further investigation. Effective professional learning requires activities, support and discussion – for example, in study groups cooperating together at school level or across schools – about the challenges to make sense of new learning, as well as repeated opportunities to revisit and refine the new knowledge.

Although toolkits are a practical approach to support change in educational practice (e.g., Higgins et al., 2022; Yamada et al., 2015), the results show that the toolkit alone, even if of a systemic nature, is not enough for teachers to integrate DFA into their teaching. Practical social support through teacher learning communities can be an effective strategy in helping teachers try new practices in their classroom (Vescio, Ross & Adams, 2008; William & Leahy, 2012). Therefore, the offer of the toolkit could be combined with teacher learning communities in schools in combination with joint lesson planning and support from school leaders and the toolkit use. In line with this, Country Dialogue Lab participants emphasised the value of online and offline learning communities, both for teachers and students. Other methods of support could be to send reminders or ask teachers to regularly perform self-assessments and self-regulate their learning using a diary app on their mobile phones.

Localisation and ready-to-use resources are important.

Some toolkit users commented that even if the toolkit was translated into their own language, not all resources were fully applicable to their own context. The toolkit teaching scenarios explained the process of DFA by illustrating it in example of class activities, without providing related teaching material. Therefore, the implementation of the scenario still required further investigation and adaptation to the reader's own teaching material. However, to encourage teachers to use the scenarios presented in the toolkit, it might work better to also offer them scenarios that are ready to use requiring only small changes.



Future material could address question design, non-digital alternatives and artificial intelligence

Discussions in the dialogue labs revealed a range of needs raised by teachers and students regarding DFA.

First, students mentioned that digital quizzes have been overused by teachers. Although the toolkit offers various examples of other tools and practices, the number of these could be increased to balance the number of quiz-based examples.

Nevertheless, quizzes are essential to formative assessment and the toolkit offered various examples of their use in the classroom. However, students in the dialogue labs mentioned that sometimes tests and questions are not always well designed by their teachers. It is important for teachers to design good questions that can accurately identify those students with misconceptions. Therefore, as a second point, future material for teachers could provide more guidance on designing questions and specific question examples.

Third, both teachers and students in the dialogue labs and survey respondents pointed out inequalities in students' and teachers' digital skills and the need for more time for students to get to grips with digital technologies. Teachers can benefit from guidelines for supporting students with different digital skills. Furthermore, non-digital alternatives of formative assessment can be provided alongside digital activities to help teachers adapt the teaching scenarios to different needs.

Finally, the toolkit did not address artificial intelligence (A.I.), to focus instead on digital tools that give teachers and students more control. However, the Country Dialogue Labs indicated that some schools do use A.I. tools to adapt learning content according to student needs and therefore they would be interested in having more guidance on data privacy and meaningful use of A.I. (e.g., do these tools improve or impede self-regulated learning?). As these tools could potentially support formative assessment via self-assessment, schools could benefit from guidelines for their effective and safe use.





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