MENTEP
Executive Report

Summary of results
of the field trials:
The impact of the
technology enhanced
teaching self-assessment
tool (TET-SAT)

May
2018

MENTEP

MENTORING   TECHNOLOGY-ENHANCED   PEDAGOGY

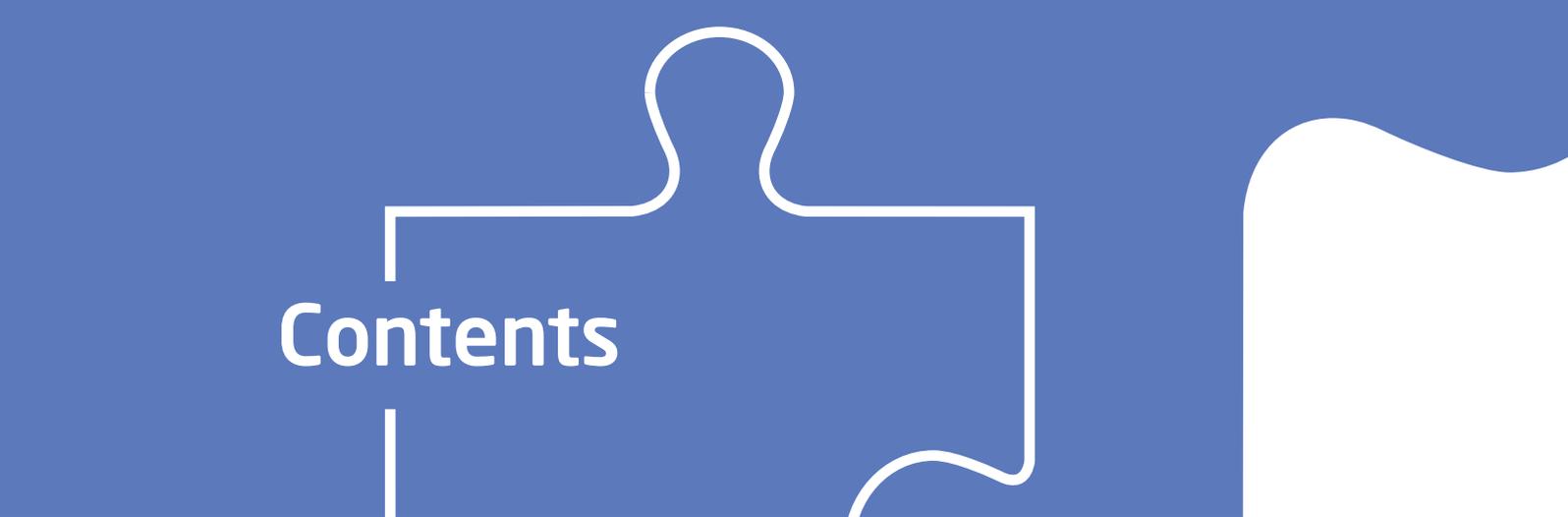European
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1. Main Findings

1.1. Rationale

MENTEP (`Mentoring Technology-Enhanced Pedagogy') was a cross-country policy experimentation designed to test the impact of using a self-assessment tool on teachers' digital pedagogical competency development. Running between March 2015 and May 2018 and 7,391, teachers from 496 schools in 11 countries took part in the experiment, the largest randomised controlled trial (RCT) to date, by numbers of participating countries, on teacher training.

MENTEP was based on a paradox. On the one hand, research shows (European Commission, 2013) that most teachers in Europe consider that using digital technology can impact positively on student outcomes. Yet, on the other hand, their own ICT use for teaching and learning and their confidence in their digital skills are low. Thus, there is a need for teachers to be able to develop further their pedagogical use of ICT and thereby translate it into a positive impact on students' learning. Additionally, there is a shortage of data on teachers' technology-enhanced teaching (TET) competency and the MENTEP policy experimentation sought to contribute new data on this.

The project was therefore designed to support and broaden teachers' reflection on their pedagogical practices using ICT in their teaching, their teaching skills and their own learning by providing access to an online self-assessment tool (Technology Enhanced Teaching Self-Assessment Tool, TET-SAT) developed in the project and assess its impact.

1.2. Theory of change and expected outcomes

The policy experimentation aimed to find out whether and, if so, how the practice of self-assessment can enhance teachers' technology enhanced teaching competency. TET competency is defined as *"the proficiency in using ICT in teaching, applying pedagogical and didactic judgment, and being aware of its implications for learning"* (Laurillard, D. 2012). It is a multidimensional competency, which includes different types of competencies, behaviours and attitudes.

The TET-SAT assesses four dimensions of digital pedagogical competence, divided into 15 sub-areas and 30 competencies. After answering 30 questions teachers receive feedback on their competency level and links to national and European online ecosystems of training resources. Beyond triggering self-reflection, the intention behind providing the TET-SAT to teachers was to increase awareness and a change in attitudes towards ICT, and a consequent increase in ICT use and TET competency through the self-assessment, feedback and an associated eco-system of training resources provided in the project.

Given the short timeframe of the field trials (when teachers used the TET-SAT), any change in awareness and attitudes was more likely to be detected during the experimentation period, whereas any increase in ICT use and skills might only be detectable in the medium- to long-term following the trials. Therefore, considering that a) teachers had only a few months to use the tool and b) the short time between exposure to the treatment (i.e. using the TET-SAT) and the follow-up survey, the evaluation focused on two outcomes that can realistically be expected to change in the short term – self-reported TET competencies and views on ICT in teaching and learning – leaving other dimensions to be studied in the future.

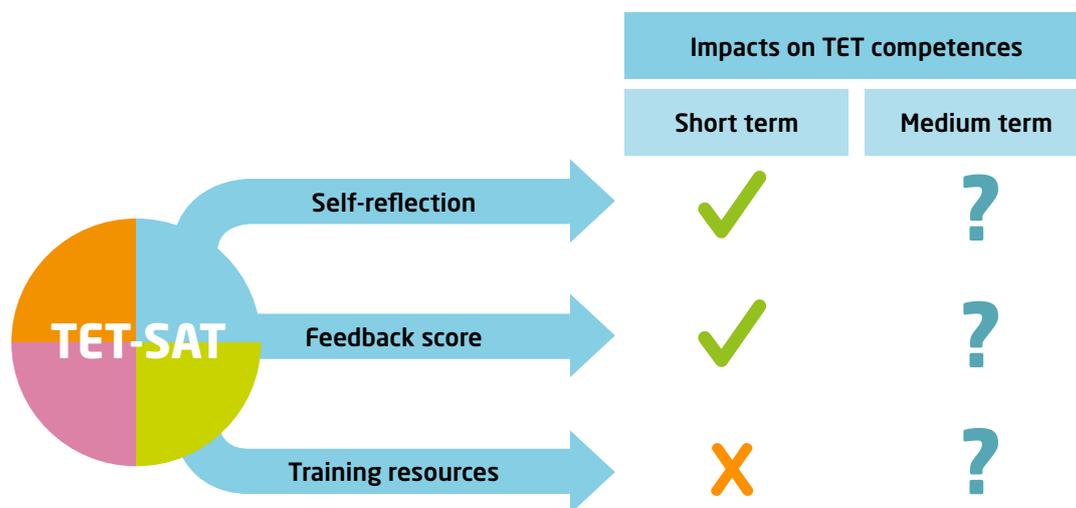**Figure 1** How the TET-SAT was assumed to impact on TET competencies

1.3. What the findings tell us

The impact evaluation results show that using the TET-SAT led teachers to develop more informed and critical assessments of their TET competency. After using the TET-SAT, teachers tended to have a more critical perception of their level of TET competencies, their self-assessed ICT ability decreased (especially among older

teachers and women), and their views on ICT in teaching and learning became more critical (especially those who started with a very high self-assessed TET competency).

Alongside the impact evaluation, MENTEP also provided fresh data about how teachers perceived their TET competency, showing they had a high level of perceived familiarity with ICT, a very high level of perceived TET ability and very positive views about ICT in teaching and learning.

The tool developed in MENTEP to test the impact of experiencing self-assessment on teachers' perception of their competency was itself evaluated by the project teachers. Those who used the TET-SAT clearly appreciated it and rated its features and content 7.5 points on a scale from 1 (low) to 10 (high). A high proportion of teachers considered that the tool was easy to use (75%), helped them assess their competency (64%), and re-think their use of ICT in teaching (62%), and that the feedback page provided useful information about their competencies in addition to the test itself (69%).

Additional data from MENTEP showed that not all teachers reacted in the same way when offered the opportunity to use a self-assessment tool like the TET-SAT. The probability of using it can be shown in two teacher profiles. A teacher of a scientific subject, with a limited teaching workload a week (12 hours), with many ICT devices at home and positive views on ICT, being highly collaborative, following training in ICT and with a high level of self- assessed ICT ability had a probability of using the TET-SAT of 50%. A teacher of a humanities subject, with a higher teaching workload (18 hours a week), no ICT devices at home and negative views on ICT, being less collaborative, not having been involved in training in ICT for teaching and with a low level of self-assessed ICT ability, had a probability of using the TET-SAT of just 15%.

2. The policy experimentation

2.1. Aims of the policy experimentation

The main objectives of the MENTEP policy experimentation were the following:

- Monitoring and improving teachers' TET competency by developing a reliable, user-friendly and sustainable tool with which teachers can self-assess the state of their TET competencies as well as their subsequent training progress
- Achieving an understanding of existing TET competency policies and revealing teachers' competencies at individual, country and EU level as well as monitoring its development during the experiment and the persisting demand for training
- Evaluating the usefulness of the tool, its effect on teachers' TET competencies and peer learning
- Identifying optimal conditions for the tool to be used and spreading and sustaining the tool, the experimental approach and the findings
- Investigating the feasibility of European-wide certification of TET competence and increasing national capacity in running field trials and policy experimentation

The results of testing TET-SAT as a certification tool and the overall conclusions on implementing the policy experimentation are summarized separately in the global MENTEP self-evaluation report.

2.2. Evaluation question

The core idea of the experimentation was to test a policy measure, namely to provide teachers with an online self-assessment tool (TET-SAT), available in 12 languages[1], to assess their TET competency and direct them to specifically created ecosystems of relevant online training resources in their countries and in their language (one national online portal per participating country in the national language) and to a European portal in English (established by European Schoolnet, which is the same for each country).

The MENTEP evaluation started with a simple question "Does the Technology-Enhanced Teaching Self-Assessment Tool (TET-SAT) impact on teachers' Technology-Enhanced Teaching (TET) competencies?"

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1 The TET-Sat was available during the field trials in Czech, English, Estonian, Finnish, French, Greek, Italian, Lithuanian, Norwegian, Portuguese, Slovenian, and Spanish.

As with all impact evaluation questions, this question comprised two components: an outcome (TET competencies) and a treatment (using the TET-SAT).

The TET-SAT is an online tool developed in the MENTEP project for teachers to self-assess their technology-enhanced teaching (TET) competence. Personalised feedback is provided on their competence levels in four areas and they are directed towards national and European training resources to further develop their TET competence.

2.3. The Technology Enhanced Teaching Self-Assessment Tool (TET-SAT)

The TET-SAT (used in the treatment) was co-designed by scientific and national experts from the countries participating in MENTEP. It was inspired by existing national tools in use (e.g. Teacher Mentor (Norway)) and EU and global frameworks (e.g. DIGCOMP, UNESCO). The online tool assesses four dimensions of digital pedagogical competency: digital pedagogy, digital content use and production, digital communication and collaboration, digital citizenship, divided into 15 sub-areas and 30 competencies.
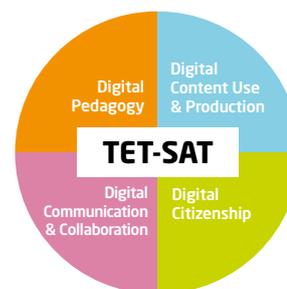
In each of the four areas a set of descriptive items is presented to users illustrating different TET-competencies in the relevant sub-areas. Each competency is illustrated by five statements describing relevant practical pedagogical situations at five competency levels. Users read the five statements, reflect on their actual teaching practice and select the one that most closely matches their own pedagogical behaviour. In order to provide a competency score, each of the five statements represents one competency level, level 1 starter, level 2 beginner, level 3 capable, level 4 proficient, level 5 expert. However, to stimulate teachers' self-reflection and discourage a response set and social desirability bias, the ranking is not disclosed and the five statements are presented in random order.

Figure 2 shows an example of the statements for one competency area.

Figure 2 Example of a TET-SAT item

After selecting an item in each competency area (30 in total), teachers receive instant personalised feedback on the TET-SAT feedback page: an overall average score (as a percentage) including a brief explanation of their level of competency, and a percentage of the level achieved for each sub-area. They are also directed towards optional national and European training resources to further develop their competencies if they wish.

2.4. Experimental design

In order to isolate the effect – the impact of the tool – a randomised control trial was conducted. Randomisation ensures that the control group represents the counterfactual, i.e. the situation we would observe in the treatment group if its members had not taken the TET-SAT. Participants in randomly selected schools were divided into test and control groups. A random sub-group of teachers in the test schools received a set of encouragement e-mails explaining how to use the tool and why they should. All other teachers, both in the test and control schools, received no information.[2] The experimentation was based on the `no one forced, no one denied' principle. Encouraged teachers were not obliged to make use of the tool and control group teachers were not prevented from using it. The status of each participant was tracked via the online TET-SAT platform and used in the data analysis. The effectiveness of the TET-SAT was calculated by comparing the group of teachers encouraged to use the TET-SAT and the group of non-encouraged ones on a given set of outcomes. This was collected after the implementation of the intervention via a follow up survey (FuS). A Benchmark Survey (BS) was administered at the beginning of the field trials to all teachers to check if both groups were statistically comparable.

2.5. Sampling

The sampling of the schools to be invited in the project aimed to provide external validity, i.e. making it possible to generalise the results of the analyses to the reference population of schools. Countries, in preparing for the field trials, were asked to deliver a list of ISCED-2 publicly funded schools with at least one digital device (computer or tablet) for every five students, internet connections in the classroom and basic communication facilities (virtual learning environments or learning platform, or, at its simplest, professional email addresses used by teachers). The reason for the inclusion of eligibility criteria in the choice of the sample was twofold. First, teachers should not face high barriers for the use of ICT in their teaching; second, the sample of schools must be comparable across countries.

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2   Some teachers in the encouraged schools were not informed about the existence of the tool to study a possible peer effect.

The proportion of eligible schools according to these criteria varied across countries. Although these criteria were easily met by all the schools in most countries, in Italy, Lithuania, Spain and Greece only a proportion of schools could be included.[3] The sampling process was divided into two steps. First, schools were randomly assigned to test and control schools. Second, teachers within the test schools were randomly divided into encouraged and non-encouraged teachers. However, in some countries all teachers in the test schools were encouraged as there were insufficient teachers per school.

In order to have sufficient numbers to estimate reliably the impact of the TET-SAT on teachers' attitude and behaviour, a minimum threshold of 1,000 teachers per country was set. However, as table 1 shows, this number was not reached in all countries. To achieve this goal, all teachers with contact information were invited via email to take part to the project by filling in the Benchmark Survey.[4] The last column of the table shows the number of teachers who completed the BS, hence actively took part in the project (for this reason we labelled them MENTEP teachers). In total, 7,391 teachers actively took part, the highest participation being in Spain (1,043) and the lowest in Estonia (314).

| Country	MENTEP Schools	Teachers with contact information	MENTEP teachers
Cyprus*	34	590	422
Czech Republic*	52	813	523
Estonia	32	705	314
Finland	52	1,969	847
France	-	-	712
Greece*	50	393	326
Italy	50	1,752	745
Lithuania	50	1,519	812
Portugal	50	2,797	798
Slovenia	50	931	858
Spain	49	2,246	1,034
Total	**469**	**14,649**	**7,391**

*Note: In these countries, most schools sent only the list of teachers giving consent to handle personal information

Table 1. Total number of teachers with available contact information and number of sampled teachers, by country

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3   A detailed account of the sampling procedure and results can be found in the deliverable 3.1. Technical Report on the sampling.

4   An intermediate random sampling of teachers to be invited was set at this stage; however, at the end, all the teachers with contact information have been invited to take part to the project. See the Technical report on sampling (deliverable 3.1) for additional details.

2.6. Data Collection and Survey Instruments
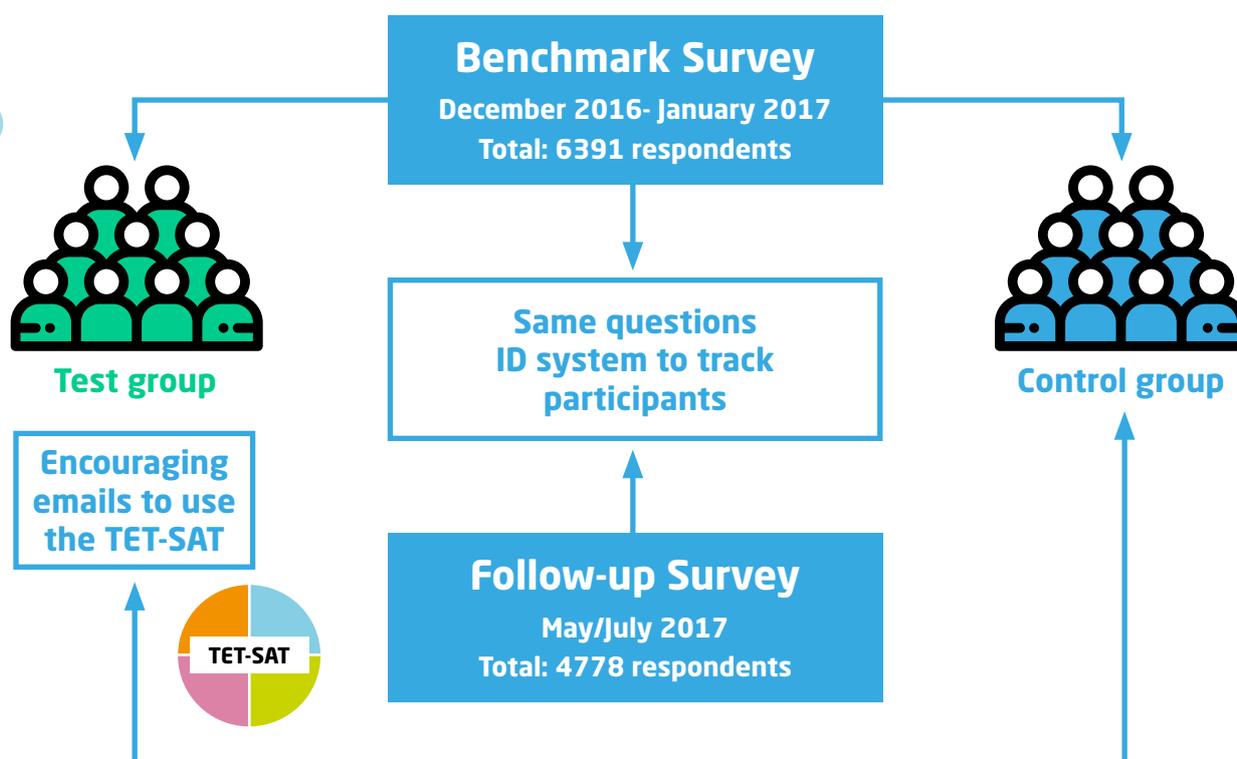
The field trial took place from December 2016 to mid-July 2017. All teachers in the sampled schools received an email invitation to fill in the Benchmark Survey (BS) at the beginning of the experimentation in December 2016. Teachers in the control group received an email invitation to use the TET-SAT in March 2017. The field trials ended with the email invitation to complete the Follow up Survey (FuS) to all MENTEP teachers during the period mid-May until mid-July (with slight differences between countries). The Benchmark Survey asked for information on the personal and professional background of the participants as well as on their pre-existing TET competencies and attitudes. The aim of the FuS was to gather information on the main outcomes (views and self-reported TET-competency) to estimate the impact of the TET-SAT. Some questions were added in order to gain additional information on how the TET-SAT was perceived by those using it. Both surveys used internationally validated questions and scales.[5]

A second data source capturing actual use of the tool was obtained by monitoring teachers' participation in and use of the TET-SAT[6] and their score on completing it. Competencies were captured differently in the tool and the surveys because the survey questions of the BS and FuS were not intended to be too stimulating and so have an effect on competency.

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5   The Benchmark and Follow-up Survey questionnaires are available in D.3.3. Technical Report on the econometric analysis accessible at: http://mentep.eun.org

6   An overview about the TET-SAT tool and self-assessment items can be found in D. 2.2. Blue print (in English) of the TET-SAT accessible at: http://mentep.eun.org
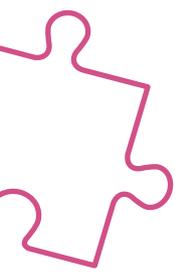
Moreover, if questions in the two administrative surveys were too similar to the TET-SAT they could have induced a 'memory effect' in the encouraged teachers that could have biased the results. Questions assessing competencies were therefore phrased differently in both instruments and according to their goals: the tool aimed to stimulate teachers' reflection on ICT use, but the two surveys aimed only to measure competencies. The surveys used a 7-point self-assessment scale for teachers to rate their competency. The TET-SAT, on the other hand, had 30 items each with five statements identifying five levels of TET competency and teachers had to choose the one most closely matching their level.

## 2.7. Experimentation results

Response rates

A total of 469 schools and 7,391 teachers were recruited across the 11 MENTEP countries. Of the total number of teachers who became "MENTEP teachers" by filling in the Benchmark Survey, 5,598 also responded to the Follow-up Survey and hence became part of the analytical sample used to produce the TET-SAT's impact estimates across countries.

As apparent from table 2, the total response rate was high (75.6%), especially considering the fact that the surveys were administered online. Differential attrition, i.e. the difference in attrition level by group, peers and non-encouraged teachers, shows higher response rates than encouraged teachers (82%, 78.6% and 69.7% respectively). Differential attrition, i.e. the difference in attrition level by group, shows higher response rates for peers and non-encouraged teachers than for encouraged teachers (82%, 78.6% and 69.7% respectively).

School type	Teacher group	N of teachers			Response rate
		Benchmark	Follow-up	(FUS-BS)	
Overall					
Non-encouraged	Non-encouraged	3,641	2,861	-780	78.60%
Encouraged	Non-encouraged	1,000	820	-180	82.00%
Encouraged	Encouraged	2,750	1,917	-833	69.70%
Total		7,391	5,598	-1,793	75.70%

Table 2. Response rates by randomisation design and randomisation group

An investigation of the sample on which the impact of the intervention was estimated was carried out to identify if the groups were truly comparable (internal validity) against a set of variables (gender, age, subjects, ICT training, positive views on ICT training). It shows that the three groups were still comparable.
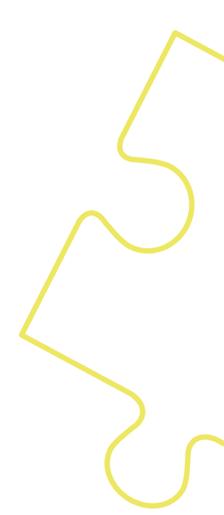
Starting digital competency level and views of participating teachers

The overall picture coming from the BS data is that MENTEP teachers had a high familiarity with ICT, a very high perception of their competencies to exploit digital resources in teaching and very positive views concerning the benefits of new technology for both teaching and learning. For instance, all of them had some device at home and about 50% spent more than one hour a day using ICT at home (see full evaluation report). MENTEP teachers also believed they had very high TET competency; for example, 90% considered that they could stimulate students to use ICT in a critical manner, 71% that they could redesign ICT apps in specific educational settings.

Teachers also held very positive views about ICT in teaching and learning; for example, 94% thought that using ICT at school enabled students to access better sources of information and 76% that it helped students develop greater interest in learning. Teachers were positive, but to a lesser extent, that ICT could help children develop self-regulation (65%) in learning as well as enhance their academic performance (60%).

The take up rate of the TET-SAT

As in all experiments, not all teachers assigned to the treatment group actually made use of the intervention offered, i.e. not every teacher to whom the set of encouragement emails was sent actually decided to try out the TET-SAT and complete it. As shown in Table 3, the proportion of encouraged teachers deciding to start the TET-SAT among those receiving the encouragement letter amounted to 33.8 percent and the share of those who started and completed it was 26.7 percent.[7]

From a substantive point of view, these numbers can be seen as an estimate of the 'natural' take-up rate of such an intervention. For policy makers interested in using the TET-SAT, these data show that a light-touch invitation sent to the entire teacher population can result in a take-up rate of between one-fourth and one-third. However, as the table shows, the TET-SAT take-up rate varied considerably across countries (from a minimum of 16% to a maximum of 61%, when considering the percentage of teachers who started using the tool). This variability could be explained by a mixture of contextual factors (e.g. a culture of self-assessment in national professional development frameworks, or the adoption of new technologies in schools) and MENTEP-specific organisational aspects (e.g. the actual implementation of the experimental protocol).

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7   Among the teachers who made use (and completed) the TET-SAT, the fraction of those who used it more than once during the experimental period happened to be low (8%).

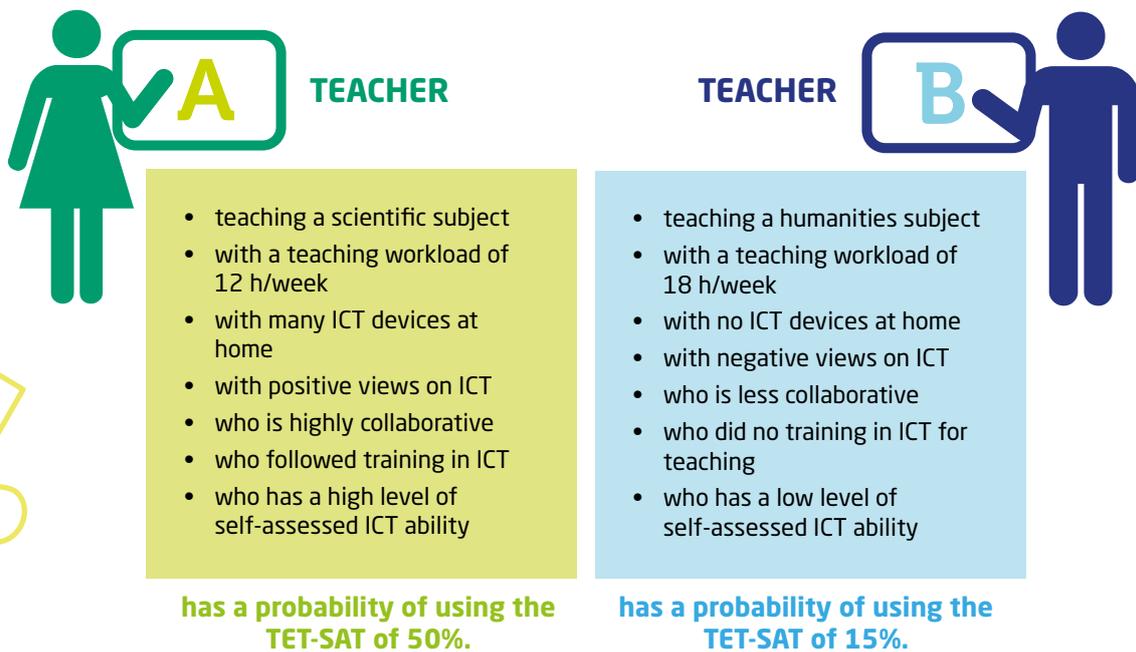| Country	Total number of encouraged teachers	Encouraged teachers who started the TET-SAT		Encouraged teachers who started and completed the TET-SAT	
		N	%	N	%
CY	210	112	53.3	98	46.7
CZ	250	42	16.8	32	12.8
EE	135	36	26.7	25	18.5
ES	340	126	37.1	103	30.3
FI	291	48	16.5	35	12.0
FR	356	116	32.6	83	23.3
GR	152	77	50.7	68	44.7
IT	256	62	24.2	45	17.6
LT	255	89	34.9	69	27.1
PT	246	64	26.0	42	17.1
SI	259	158	61.0	134	51.7
Total	2750	930	33.8	734	26.7

Table 3 .TET-SAT take-up rates

In the FuS, encouraged teachers who did not use the TET-SAT were asked why not. Among reasons for not using the TET-SAT (Table 4), the main one was that they were not aware of it. This is an unexpected finding, considering that a set of emails was successfully sent to all encouraged teachers. According to some National Coordinators, teachers in some countries may have confused the emails concerning the two surveys with the ones to invite them to use the TET-SAT. It is not clear to what extent this explanation holds true across countries. However, the finding calls for more attention in future implementations of such a design to carefully monitoring communication with the experimental group. The second – and less unexpected – reason mentioned by teachers was lack of time. Based on available anecdotal evidence as well as on the MENTEP figures (see full evaluation report), 90% of teachers' working time is devoted to teaching, preparing lessons and carrying out administrative duties, leaving little room for training.

Main reason	Overall
Unaware of it	32%
Time constraints	30%
Not interested in self-assessment	10%
Already competent	4%
Could not access	4%
Do not use ICT	3%
Not interested in training	1%
Other	15%
Number of respondents	1,091

It goes without saying that teachers using the TET-SAT were a self-selected subset of the encouraged teachers and that, for this reason, the characteristics of these two groups of teachers were, on average, not comparable. Some characteristics are strongly associated with the use of the tool: teaching a science subject, working more hours in non-teaching tasks, using ICT at home and, most importantly, having positive views on ICT in teaching and learning and that thinking they have high levels of TET competencies. Teachers with these characteristics were more likely to accept the invitation to use the TET-SAT.

TEACHER A

- teaching a scientific subject
- with a teaching workload of 12 h/week
- with many ICT devices at home
- with positive views on ICT
- who is highly collaborative
- who followed training in ICT
- who has a high level of self-assessed ICT ability

has a probability of using the TET-SAT of 50%.

TEACHER B

- teaching a humanities subject
- with a teaching workload of 18 h/week
- with no ICT devices at home
- with negative views on ICT
- who is less collaborative
- who did no training in ICT for teaching
- who has a low level of self-assessed ICT ability

has a probability of using the TET-SAT of 15%.

Teachers who used the TET-SAT indicated high levels of satisfaction both with respect to technical features (for details see full evaluation report) and its perceived usefulness (see table 5).

Item	Agree
TET-SAT helped me to assess my competence	64%
TET-SAT helped me to re-think use of ICT in teaching	62%
TET-SAT took too much time	38%
TET-SAT was boring	30%
TET-SAT was useful	63%
TET-SAT was easy	75%
Feedback page useful to assess my competences	69%
Resources useful to improve teaching	51%
Overall satisfied	63%
Self-comparison useful	55%
I would recommend tool	60%
Inspired to try new practices in my teaching	54%
I prefer to use self-assessment tool to other methods of ass.	57%
Number of respondents	818

Table 5. Teachers' opinions on the usefulness of the TET-SAT

The TET-SAT feedback score

The feedback score can be understood as a piece of 'objective' information that teachers receive about their TET competencies. In principle, receiving this information can alter the way teachers perceive their own competencies. However, the information in the score has a different value depending on the extent to which that score is in line with what teachers thought about themselves before taking the TET-SAT. While for some teachers the feedback score may simply confirm what they already know about their competency (i.e. this would be the case when the feedback score matches with the pre-treatment self-assessment in the BS), for some other teachers the feedback could represent an information update. The latter can be negative (when teachers receive a score lower than what they thought) or positive (when the feedback 'tells' teachers that they are more competent than they thought).

Figure 3 shows a scatter plot of teachers' self-reported TET competencies collected in the BS (vertical axis) and teachers TET-SAT feedback score (horizontal axis).
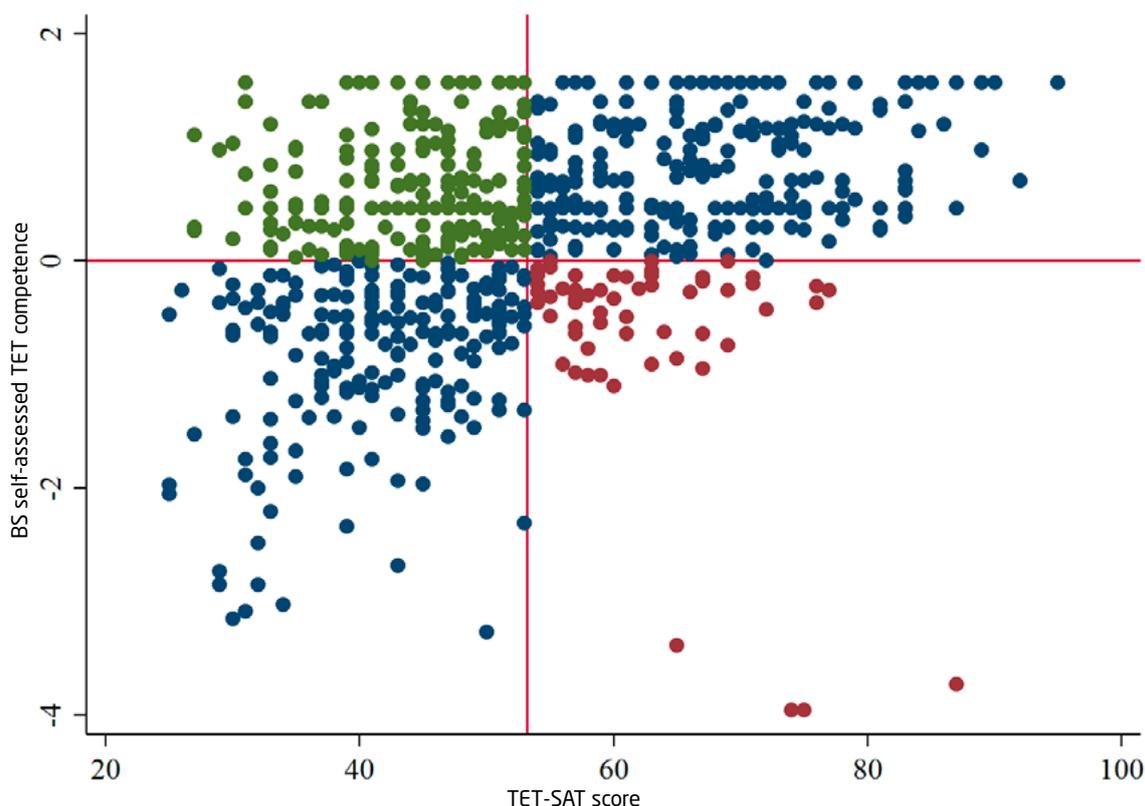

Figure 3. The "information value" of the TET-SAT feedback score

The red vertical and horizontal lines represent the average values of the two variables. It is important to stress the purely descriptive purpose of this figure. By no means do we claim that the two measures are directly comparable. Teachers do not directly compare the two measures as only the feedback score is known to them in numeric
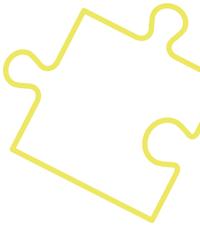
form, while the level of self-reported competency is computed by pooling the items of the scale used in the BS. The analysis can be simplified by considering only the location of these teachers above or below the average. A possible interpretation of this figure is that for most teachers (about 68%, blue dots) the feedback score provided a confirmation of their self-reported level of TET competencies. Only a marginal fraction of teachers (8%, red dots) received a positive update, while a sizeable share of teachers (28%, green dots) "discovered" as a result of using the TET-SAT that their level of TET-competencies was lower than they thought. For the latter, the feedback score could represent an 'information shock' (Gonzalez, 2017).

The impact of the TET-SAT

The main effects of the TET-SAT are computed by comparing the test and the control teachers from all participating countries – the overall sample.[8] More precisely, we assess the impact of the TET-SAT by estimating separately its impact on **self-reported TET competency** and on **views on ICT in education**.

The results show (Table 6) that using the TET-SAT led teachers to revise more critically their competency in TET and their opinions about ICT in education. Both results are statistically significant at 5% and at 1% levels respectively. Teachers using the tool self-evaluated themselves, on average, 0.14 standard deviations less than control group teachers and revised their opinions downward by 0.35 standard deviations.

	Average value for controls	Effect Size
Self-reported TET competence		
Treatment	0.02	-0.138**
Positive views on ICT		
Treatment	0.02	-0.351***

*** p<0.01; ** p<0.05; * p<0.1

Table 6. The impact of the TET-SAT on self-reported TET competence and views on ICT in teaching, overall sample.

Using the original scales of the variables, instead of the standardized ones, the effect on **self-reported TET competency** is equal to -0.12 on a scale ranging from 1 to 6, with an average score for control group teachers of 4.7. This means that the effect is quite small in absolute terms, and that test teachers still had a very high opinion of their TET competencies, even if a little lower than that of control group teachers. As concerns **views on the use of ICT in teaching**, the average value for control group teachers is 3, on a scale from 1 to 4 (1 means total disagreement with positive statements about ICT and 4 total agreement).

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8   The effects of the TET-SAT are reported on the overall sample. Given the number of teachers by country, we cannot produce country-level estimates of the impact of The TET-SAT. More details on the econometric model implemented to produce the impact estimates can be found in D. 5.1. Evaluation Report.
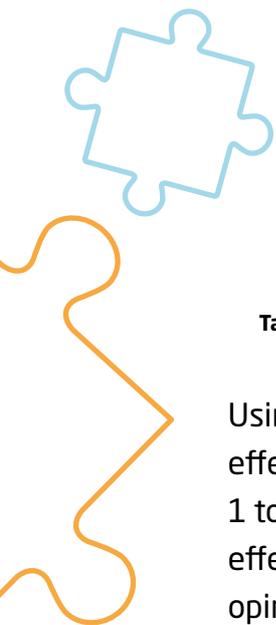
The estimated effect on the original scale is -0.16, meaning that respondents shared, by and large, positive views about ICT in education and that the downward revision induced by the treatment did not alter respondents' generally positive feelings about ICT.

The heterogeneity of the causal effect along different dimensions was also studied. First, the difference across genders and age groups was investigated. The effect on TET competency was stronger among females than among males, even if in both cases the coefficient was negative and the confidence intervals of the two effects strongly overlapped. On the other hand, no difference was detected among teachers of different age groups. The effect on views was similar for males and females, but stronger for older teachers. Note that also in this case the sign of the effect points to the same direction for both groups and that the confidence intervals of the estimates strongly overlap.

The take-up rate of the treatment among teachers invited to use the TET-SAT was highly variable across countries. Cross-country cultural differences with respect to the use of ICT in teaching might explain this heterogeneity, among other reasons. These in turn might even be a factor explaining heterogeneity in the causal effect of the TET-SAT. As in the previous cases, the sign of the impact was uniformly negative, but in high take-up rate countries the impact of the TET-SAT was larger on both outcomes.

We conclude that the field operations were successful, despite the complexity and novelty of the policy experimentation. National Coordinators and teachers responded to the challenge of taking part in a randomised controlled experiment with high levels of professionalism. There are clear signs that teachers appreciated the TET-SAT, its usability, topics covered and resources suggested. Teachers also clearly made use of the feedback from the TET-SAT by revising slightly downwards both their high beliefs about their own competency in using ICT for teaching and, as a by-product, their views on whether ICT is useful in teaching and learning.

3. Interpretation of findings and conclusions for policy making

The MENTEP policy experimentation shows that running robust policy experimentations is not only recommended but also practically feasible. From the initial design of the experimental protocol to the results and policy implications in different contexts, the MENTEP experience provides a wealth of lessons for education policy makers seeking to strengthen the evidence base and enhance evaluation efforts across Europe.

There are five key findings:

1. **Take-up rate of the TET-SAT:** Policy makers considering using the TET-SAT should take into account the fact that sending light-touch invitation emails to the entire teaching population is likely to result in a take-up rate (i.e. the percentage of teachers who start to use the tool) of between one-fourth and one-third. The TET-SAT take-up rate shows considerable variation between countries, ranging from 16% to 61%. This result was discussed in national workshops after the experimentation and a variety of explanations were put forward, in particular cultural differences with respect to the use of ICT in teaching. Another reason relates to different attitudes to self-assessment, with which teachers in some countries teachers are less familiar. A third explanation could be the fact that other surveys were running or alternative tools were available at the time of the experimentation. Whatever the reasons, this result shows the importance of considering carefully how to raise the interest and cooperation of teachers to improve their participation rate, for example exploring additional communication channels (face-to-face or virtual meetings, phone calls) and to monitor carefully communication with experimental teachers.

2. **Not all teachers react in the same way.** Those who reacted more positively to using the TET-SAT were younger teachers, teaching scientific subjects, with a limited teaching workload (12 hours a week), having many ICT devices at home and positive views on ICT, being highly collaborative and engaged in professional development. If the intention is to reach out to more teachers
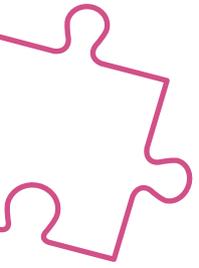
including those with different profiles (less familiar with ICT, higher workload, less involved in training, etc.), the intervention could be accompanied by a range of formal and informal support measures. These could include linking the tool to specific training, recognition of different teacher beliefs, allocating time to use the tool at school (individually, in pairs or groups) and initiating whole-school dialogue about the tool among teachers and school heads. Some MENTEP partner countries are already exploring the use of the tool in this way as a means to identify training needs, linking teachers to a training programme throughout the school year and encouraging collaborative reflection. Whilst this can help, the data also tell us that self-assessment may not suit everyone and that other actions to reach out to specific subgroups of teachers to develop their TET competency need to be envisaged.

3. **The quality of the tool was high.** Teachers who used the TET-SAT indicated high levels of satisfaction both with respect to technical features and its perceived usefulness. Policy makers therefore have at their disposal a tested tool which is appreciated by teachers. The tool is accessible on the European Schoolnet platform or as an open educational resource for local adaption and installation. In order to exploit fully the potential of the tool, it should be linked to relevant and up-to-date national and European ecosystems of training resources which should be promoted to teachers as much as the tool.

4. **The focus was on two short-term impacts – opinions on the use of ICT in teaching and learning and self-reported TET competencies** – owing to the project's relatively short duration. Using the TET-SAT caused teachers a) to revise slightly downwards their beliefs about their own competency in using ICT for teaching and b) their views on whether ICT is useful in teaching and learning. A sizeable percentage of teachers (28%) discovered, through using the TET-SAT, that their level of TET competencies was lower than they thought. This decrease in self-assessed competency can be expected: teachers who used the tool were able to assess their competency in a more informed and critical manner. The second finding is obviously unexpected, and at first sight less desired. The downward revision of perceived views may, as for the self-assessed competencies, also be a sign of the fact that the TET-SAT triggered self-reflection on respondents' practices, helping them to adjust in a more informed way also their prior assumptions about ICT in education. A further possible explanation for the downward revision of self-reported competency is the role of the feedback score. The feedback score can be understood as a piece of objective information that teachers receive about their TET competencies.
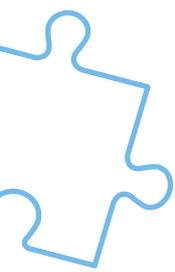
In principle, receiving this information can alter the way teachers perceive their own competencies. As the data show, the information in the score has a different value for teachers depending on the extent to which that score is in line with what they thought about themselves before taking the TET-SAT.

5. **Unintended side effects:** this finding also offers a new perspective about unintended side effects revealed only by properly testing the effectiveness of interventions via a randomised controlled trail. RCTs, increasingly seen as the gold standard for education, stem from medical research as an essential process to investigate both the intended and unintended effects to evaluate not only the benefits but also the risks of taking a medicine. Studying and reporting both effects and side effects can help to make more informed decisions. MENTEP partners consider the side effects an integral part of policy experimentations to help education policy makers improve policies and take account of unintended consequences.

Future research could yield further insights about longer-term impacts, the persistence of the effects identified and on the existence of an impact on other types of TET outcomes, for example, actual behaviours and use of ICT in teaching and participation in further professional development in ICT.

The full evaluation report (D. 5.1) is accessible at **http://mentep.eun.org**
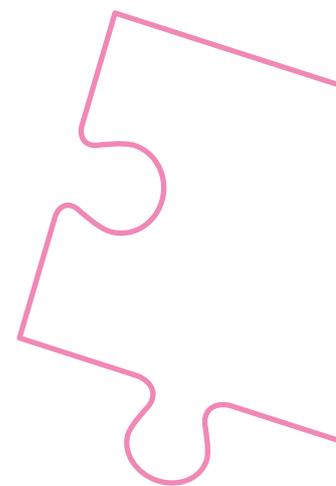
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About MENTEP

MENTEP (Mentoring Technology-Enhanced Pedagogy) was a major European Research project to boost teachers' competence and confidence to use Information and Communications Technologies (ICT) in the classroom. The project, which run from March 2015 to May 2018, investigated the potential of an online Self-Assessment Tool (SAT) to empower teachers to progress in their Technology-Enhanced Teaching (TET) competence at their own pace. National public authorities and 11,000 teachers in 11 partner countries participated in the project: Cyprus, Czech Republic, Estonia, Finland, France, Greece, Italy, Lithuania, Portugal, Slovenia and Spain. European Schoolnet, a network of 30 ministries of Education in Europe coordinated the project and FBK-IRVAPP, the research institute for the evaluation of public policies in Italy, was responsible for the quantitative evaluation of the project. Participating Teachers completed two short surveys, one at the beginning and one at the end of the school year 2016/2017 about their use of ICT in school. All information provided by teachers was treated anonymously and privacy rights are fully respected. At the end of the project, MENTEP teachers received a certification of participation.

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