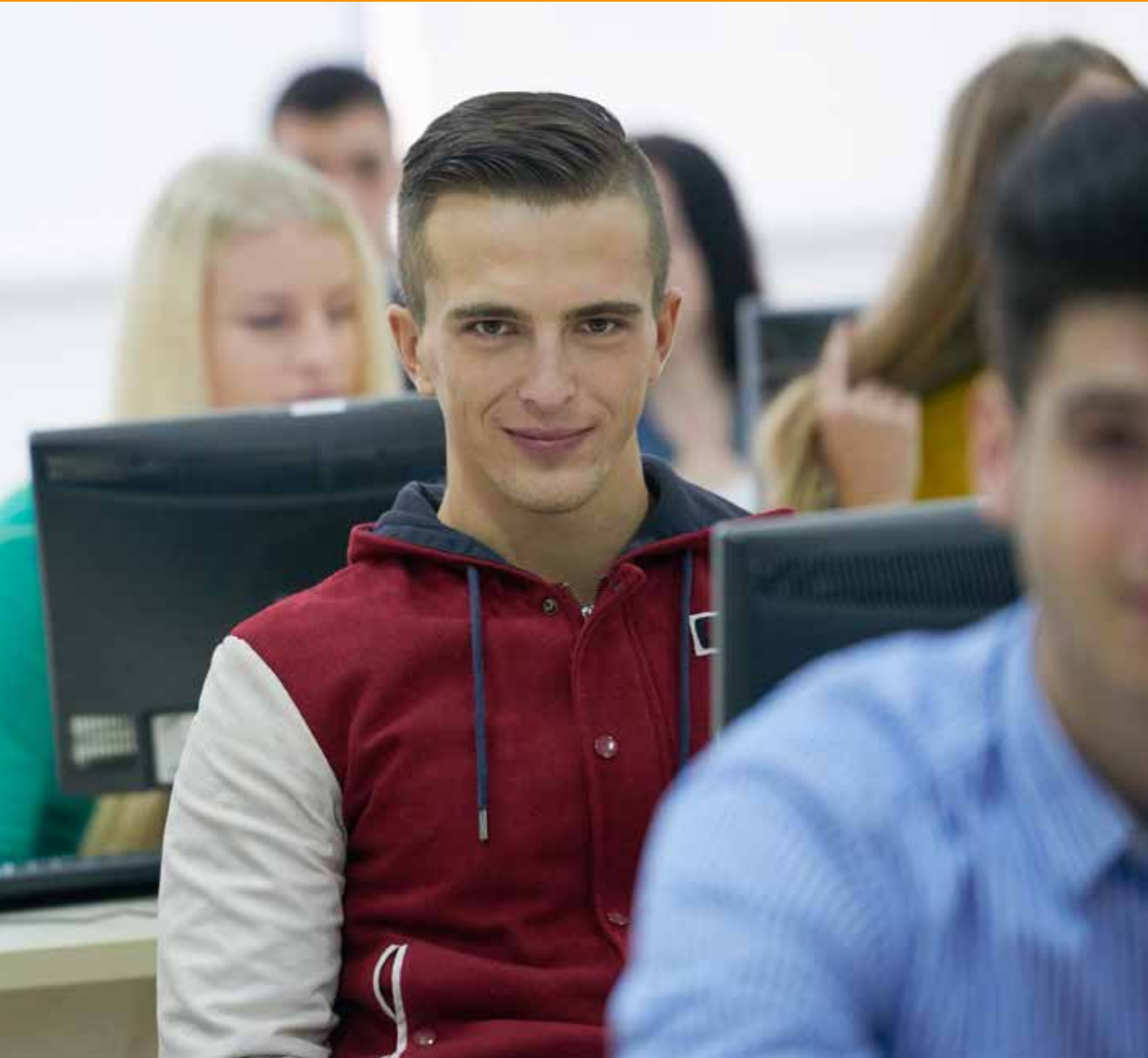


THE **INVALSI** TESTS ACCORDING TO **INVALSI**

IN BRIEF
(OR TO FIND OUT
MORE)



INVALSI



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WHY THE TESTS ARE DONE

Although in Italy youngsters spend more time in school than in most other countries, schools are unable to close the gap in the social inequalities they enter with. According to international surveys, one significant reason for this is that our children are not generally as good as others when it comes to applying what they have learned. As if some aspect of the Italian school system fails when it comes to “running that extra mile”.

Using the same tests for everyone helps us to identify areas that need improvement.

Not surprisingly, they are carried out in almost all European countries. Because the state school system cannot allow to have “a league” and “b league” classes.

Article 3 of the Constitution states that “It is the responsibility of the Republic to remove the economic and social obstacles which, by limiting the freedom and equality of citizens, prevent the full development of the human person and the effective participation of all workers in the political, economic and social organisation of the country.” A crucial part of this responsibility is entrusted to the schools, which help to train children as people, citizens and workers, and which have been protagonists in the radical transformation that the country has undergone in recent decades. However, there are signs that part of the Italian school system is not currently able to perform that role in full.

Although pupils spend plenty of time in the classroom, schooling does not manage to reduce the inequalities they start out with. Fifteen out of one hundred pupils leave before they have graduated. This number rises to thirty if we calculate the difference between those enrolled in the first cycle and those who graduate from high school. This leakage is four times higher for children whose parents have, at most a middle school diploma versus children whose parents have a university degree. Similar data is obtained when comparing the professional profiles of parents. Moreover, the educational results of those who continue to study are much higher among pupils whose families have better socio-economic conditions. The outcome is that more than one in five young people between 15 and 24 are not studying or working. Another sign is the growing difficulty of matching demand and supply of labour. In many areas, a high rate of youth unemployment goes along with companies struggling to find qualified staff, at all levels. Italy has become one of those countries with little connection between qualifications and the possibility of finding work, or the professional and economic level achieved. Mirroring all this is the cultural weakness of the country, as evidenced in several national and international surveys, along with cultural consumption data: only 30 Italians out of 100, aged between 16 and 65, have a sufficient level of *literacy and numeracy* to interact effectively in an advanced society and economy. Obviously, this data is affected by factors that have nothing to do with schooling. Nevertheless, the international surveys, such as the OECD-PISA, tell us that not all our children are good at knowing how to apply what they have learned, or have the skills that are most needed today. This, on the other hand, confirms an observation that has often been made, namely that the schooling traditionally provided in our country is based more on acquiring knowledge than skills. Knowing rather than know-how.

The school system has not stood still in recent years, but there is a considerable difference in its capacity to respond to these challenges between the North and the South of the country, and within each single school itself. INVALSI arose out of a need to measure the learning outcomes of some key competences actually, and therefore to encourage and verify the needed transformation/innovation of the Italian school system. This measurement can only be carried out by means of objective testing that is the same for everyone. Only if everyone is measured using the same yardstick the obtained data will enable us to examine the phenomenon with the highest resolution. Furtherly these data will be comparable across space and time and hence truly useful. It is not by chance that the same solution - to the same problem - has been adopted by almost all European countries, who have introduced evaluation and self-assessment systems based on standardised tests managed by institutes like INVALSI. If education is fundamental to ensuring equal opportunities for all, state schools have a duty not to allow the existence of “A league” and “B league” areas, schools, or classes. Whereas if education were privatized, there would be no need for the INVALSI tests.

THINKING FOR ONESELF

In a changing world, school must inevitably change as well. Whereas, in the past, people were mainly expected to carry out tasks designed by others, the people of today must be able to think and decide for themselves. Pupils must therefore study what they have always studied, but they must also get used to using the knowledge, linking it to other knowledge, and applying it to solve new problems.

This is why the tests are not simply a memory exercise, but one of reasoning.

As the world gradually becomes more complex, we need to know

more things. This is why people go to school for longer. But we also need to learn different things, because the world is no longer the one that shaped the type of schools we have inherited.

Simplifying a little, but not too much, twentieth century industries and bureaucracies needed trained workers rather than people capable of initiative. "Standardized" employees who were able to comply with roles and procedures since, in both the public and private sectors, the thinking and decision-making was done by just a few. The available technologies favoured a top-down communication as well. And what was learned at the school desk was good enough for a lifetime.

That mass society is giving way to a very different society (and, let us

not forget, a more mature democracy), which needs more autonomous, resourceful, responsible people, who are willing to take initiatives and learn throughout life. People who are capable of inventing new things because they have not simply accumulated knowledge but know how to use it. People who can figure out the best course of action for themselves. People who can connect to other people, information, machines, organisations or cultures. People who are prepared for jobs that do not yet exist and problems that we cannot foresee. As workers, citizens and persons. In other words, we need people who have more skills.

The concept of "skill" comes into Italian school legislation through the "Indicazioni Nazionali" ("National Guidelines" differentiated for grade and/or school type) and "Linee Guida" (Guidelines for specific high schools types) that set the educational standards (edited by the Ministry of Education, University and Research). The explicit reference is to the definition given by the European Union: "proven capacity to use knowledge, abilities and personal, social and/or methodological capabilities, in situations of work or study and in professional and personal development." There is clearly no conflict between knowledge and skills. Increase in the latter does not mean a decrease in the former. Their integration is not a zero-sum game. Indeed, disciplinary knowledge forms the basis of skills, without which they cannot be developed. But it is skills that enable one to use knowledge, link it, and apply it to new problems. If the old programmes - those of the twentieth-century schools - favoured *reproductive* learning, today's schools should develop *productive* learning. Alternatively, if this term is unpopular because it could overly emphasise the demands of the world of work, creative learning, in the real sense of the term, as the ability to "take existing things and recombine them into something new and useful". In any context. Hence, thinking and deciding for oneself.

Coherently, the INVALSI tests measure the quality of learning of

skills – adapted of course to the age of the children examined. They are therefore nothing like a memory exercise. By contrast, they measure some basics of critical thinking, which is inconceivable without the ability to understand texts, logical faculties, and the ability to solve new problems. The days of so-called "rote learning", in the sense of teaching and assessment of knowledge for its own sake, should really be over.

IMPROVING THE SCHOOL

The tests assess some fundamental skills.

All pupils must be able to understand and use a written text and express themselves in Italian. Just as mathematical knowledge must be used to tackle problems in the real world. They must understand spoken and written English. Obviously, the tests do not measure everything. Therefore, they are not used to assess either the pupil or the teacher, and they are only one of many components of a school's self-assessment. But they often make it possible to see what is difficult to see by oneself, avoiding the risk of being self-referential.

The skills among those stipulated by the National Guidelines and Guidelines to be measured by the INVALSI tests are established, grade by grade, by the Assessment Reference Framework, which also takes into consideration the relevant international documents and teaching practices.

As well as the ability to reflect on the use of language, and thereby the knowledge and correct use of grammar, the tests on Italian measure the ability to understand written texts taken from literature, non-fiction or everyday life. This understanding, examined using closed questions (with a choice of predefined answers) or open questions, relates to the nature of the text, any explanations, the meaning of different passages or specific expressions, or the author's intention.

On the other hand, the Mathematics tests measure the ability to use mathematical knowledge to solve problems, real or otherwise, logical skills, interpretation of graphs, interpretation of phenomena with a quantitative dimension, modelling, or use in various scientific disciplines.

Finally, the English tests measure the ability to understand written texts or listening passages. These are obviously important skills, not only for the study of these three disciplines, but also for all other subjects and for everyday life. For this reason, the INVALSI tests assess the quality of the overall learning process.

Clearly, however, the INVALSI tests cannot measure everything, not least because only some skills are measurable using standardised tests taken in a set time, and at certain moments of a pupil's school life. Indeed, there are important skills – for example written and verbal communication, affective and relational skills – that cannot be assessed using standardised tests. The daily contact that teachers have with their pupils represents an elective and preferential context to assess these important skills.

For this reason, the INVALSI tests cannot provide an overall assessment of a pupil, nor can they monitor and guide – as does a teacher evaluation – the learning process, considering all the environmental variables that inevitably escape standardised assessments. Nor can they evaluate teachers, who, as mentioned above, must teach many other skills in addition to those measured by the tests.

But what is the specific, unique value of the INVALSI tests, in addition to measuring those skills? The fact that it is an external, objective assessment, therefore the only one that avoids the risk of being self-referential. External assessment is thus not just the obvious counterpart to the autonomy of schools, as in all countries in which it has been introduced, but it also makes it possible to identify any educational difficulties that might have been previously overlooked.

FREEDOM OF TEACHING

The test results are an indication of the skill level reached, but they cannot explain the underlying reasons. Every situation, whether positive or negative, is determined by factors that only the teachers involved can identify.

Therefore, the tests cannot tell us how to teach, which is a prerogative and a duty of teachers.

However, they can indicate *where* the efforts should be concentrated. Developments in regulations, which over time have widened the possibility of choosing times, methods and places, has led to a gradual recognition and expansion of teaching freedom.

The outcomes of external assessment provide a map that can be used to identify difficult situations with great precision, from a national scale to that of the individual pupil. However, this data does not provide an understanding of *why* that situation generated. The learning of each pupil, in any class and in any school, is in fact subject to so many factors – social, cultural, family, psychological or contingent – that only a teacher or the teaching staff can find an answer. Nor, for the same reason, can the test results tell us *how* that situation can be resolved. This is the decision and responsibility of the teachers, whose professionalism can and must enable them to identify, the most suitable tools to individualise, and if necessary personalise, the teaching for each single. But it has not always been so.

The old “programmes” prescribed what to teach, how to teach it (the famous “didactic methods”) and at what time of the year to teach it. The autonomy of the teacher was far more restricted than it is today. As with all large twentieth-century organisations, teachers were regarded as technicians, not professionals. A gear of a factory designed by others, which must perform the same procedure for all pupils. It was not until the seventies and eighties that “objectives”, “planning” and “evaluation” began to enter the Italian school regulations: while remaining faithful to the curriculum content, there was a shift to defining endpoints, rather than blindly following the same methods for everyone. Then, during the nineties, regulations also began to take into consideration the fact that pupils have different levels of motivation, different learning style and a different learning pace. The content and objectives remained the same, but the possibility of choosing times, methods and places for teaching was opened. In the 2000s, this trend, characterized by a constant growth of the teacher professional profile, by the introduction of the construct of skills and by the drafting/edition of the “Indicazioni Nazionali” e “Linee Guida” results in the creation of INVALSI.

The freedom in teaching recognised by article 33 of the Constitution, in compliance with the “general regulations on education”, was thus finally recognised and expanded. The increased autonomy and the increased recognition of the professional role of teachers is naturally accompanied by external assessment, as a tool to ensure the right of all children to receive the same opportunities from state schools, but also as a guarantee for the educational pact between families and the school.

HOW THE TESTS ARE GENERATED

The INVALSI tests are nothing like quizzes.

To see this, you only need to read a few items. Each question is the result of two years of work by a group of teachers and school principals, with the help of national and international experts for the methodology. Each test is first trialled on thousands of children, and the results are analysed statistically.

All this is done to verify accuracy, fairness and measurement capacity.

The INVALSI test questions may seem like quizzes at first glance, and one might perhaps wonder how much the answers to a few dozen questions could possibly reveal. It is therefore worth knowing how they are generated.

The work is entrusted to over two hundred authors, chosen from teachers and school principals who are appropriately trained by INVALSI, supported in the methodological aspects by the Institute's researchers and national and international universities.

The items proposed by the authors are examined by groups working collaboratively. Each item must correspond to a specific skill pursuant to the Reference Framework for the educational level examined. There must be no ambiguity or uncertainty. The items should not favour or penalise factors such as gender, type of school, religious or political orientation of the pupil. Groups of authors take months to discuss and improve the items. Those that get through this initial selection stage are assembled in a provisional test booklet, which must contain items designed to measure all levels of learning in each skill, in numbers such that the test is not too long in relation to the time available.

The measurement of ability of each pupil is "standardised". Contrary to what this adjective may suggest, ability is not measured on the basis of an absolute scale or of any theoretical criteria or criteria that someone has established or imported from another country, but in relation to the skills actually found among the pupil population to which the pupil belongs. In other words, the difficulty levels of the items that make up the test must correspond to the skill levels found among the pupil's peers.

To check all these requirements, the booklet is pre-tested on a few thousand pupils of that cohort and grade. In total, the pre-tests involve about 30,000 children per year, which is more than enough for a statistical analysis of the results that enables INVALSI researchers to identify any remaining problems. The booklet is then returned to the working group for further analysis of the items and additional corrections. This stage lasts several months.

The items then are then re-tested on another sample of pupils to make sure that every problem has been solved.

Authors and experts work together until the final phase, and the data is then made available to any independent experts. INVALSI is after all a research institute which, as happens in every scientific field, constantly interacts with its reference community to share and improve its methods and results.

By this time, two years have passed since the work was begun, and the booklet finally becomes the actual booklet made up of the items that have "survived" all these checks.

The INVALSI test items are so precise and reliable that an examination of the incorrect answers given by a pupil can help to understand specific gaps, and therefore individualise the teaching more effectively. This is what emerged from experimentation carried out in schools that joined the PON projects, which produced a remarkable noticeable improvement in results. As of 2018, the testing mode switches from paper-based to computer-based, except for primary schools. This innovation saves teachers from the tedious task of marking and data entry finally. The results of the individual tests will no longer be available, but each teacher will still be able to give pupils the items from previous years, up to 2018, which are available on the INVALSI website. These tests can be administered autonomously at the most useful moments, that is over the course of the school year, to check learning progress and improve own teaching strategies/methods.

RELIABILITY OF THE TESTS

Clearly the results of the tests can be influenced by the background of the pupils, and this factor must be kept in mind when comparing different classes and schools. For this reason, pupils also fill in a questionnaire with family information.

The test results are also re-calculated taking the socio-economic background into consideration.

Leaving school with the same basic skills as others remains, however, a *right* that state schools must still try to guarantee to everyone.

In the early years, the INVALSI tests were rightly criticised by many teachers because the processing of results did not take the pupils' backgrounds into consideration. This can be a decisive factor for academic performance, along with the fact that often, to try to get the best score possible, you help the children in need. INVALSI researchers thus use statistical tools to improve the objectivity of the tests.

Since the 2012/13 academic year, the data for each class can be compared with that of 200 classes in other parts of Italy with a similar socio-economic context. The latter is assessed by means of a "Student Questionnaire" that is distributed each year, along with information provided by school secretaries. The questions concern factors such as origin (Italian or immigrant), the year of arrival in Italy, parents' qualifications and occupations, the conditions and facilities for studying at home, the books available, and the language spoken in the family. Since the tests carried out in the 2008/09 academic year, a statistical tool has been introduced to evaluate the probability that some results may have been "rigged" (the so-called "*cheating*" that is found in the data reporting tables). Scores that are consistently too high, answers that are too similar even when incorrect, or too like each other, or too few missing answers compared with the general levels of the test, make up a factor between 0 and 1, with which the "raw" score obtained is corrected.

The test results are therefore more reliable than in the past. The objective assessment provided by the INVALSI tests, like that which is carried out by every teacher, is difficult to obtain and never perfect. This is also because the pupils and their overall environment continue to change. For this reason, both types of assessment require continuous improvement efforts.

THE SCHOOL EFFECT

Thanks to the availability of results collected at the entrance and at the exit stages of the school career, the educational effectiveness of schools can now be better assessed.

The so-called “school effect” is the contribution made by the educational institution in changing the skill levels of youngsters.

It is possible to find out if attendance has raised this level compared with what would have been the natural development of the pupil, made no difference, or even lowered it. Along with the test scores, the school effect tells us whether there is work to be done to improve a class or whole institution, and how much.

The annual results of the INVALSI tests, alone, do not provide all the necessary elements for comparing the educational effectiveness of schools in a truly impartial way. What a pupil can do today does not depend only on the teaching received in the school currently attended, but also school attended earlier, teachers and the influence of former companions. It can therefore be very useful to know if a present-day school has managed to raise the skill level of its pupils compared with their level upon entrance, or has simply maintained it. Or worse, lowered it.

This contribution, which INVALSI has decided to call the “school effect”, has been assessed since the 2015/2016 academic year, thanks to the availability, after years of testing, of longitudinal data, i.e. data relating to entry and exit from the school cycles.

INVALSI researchers use a complex statistical model to do this but the basic idea is very simple. It involves subtracting from the exit score the score that all the pupils of the school “possessed” at the time of entry. Not only the previous score, but also a series of factors relating to the personal and educational context, such as gender, nationality, date of arrival of the family in Italy, socio-economic background of the class of origin, whether they have been advanced or held back, the number of hours of study in Italian and Mathematics, etc., each of which is “weighted” using another statistical model. The result is in relation to the whole educational institution and is presented in the form of an indication of level of school effect (positive, slightly positive, medium, slightly negative, or negative school effect). This may, for example, demonstrate that a school with unsatisfactory results in the INVALSI tests may in fact have worked very hard, since it nevertheless managed to raise the skill levels of its pupils from an even lower level upon entry. Vice versa, a school with a high score may simply have taken in pupils who were already able, and not added anything.

The school effect is an estimate rather than an objective fact, but when combined with the test score it can give an idea of how much there is still to do and is therefore an essential component of the self-assessment of a school. Because – it is always helpful to remember – the data produced by INVALSI should not be considered as a set of grades, but as useful elements for the self-improvement of every class and every school.

COMPUTER-BASED TESTS

By the end of paper-based tests from 2018, it is not just the testing mode that changes but also the way skills are measured.

With computer-based tests, the measurement is more accurate and is presented in the form of the level reached for each skill.

This is made possible by a new test construction method and the statistical analysis of the extensive amounts of data available to INVALSI after many years of activity.

The transition of the INVALSI tests from paper to computer spares teachers the laborious task of marking and data entry, with an annual saving of some 22 truck-loads of paper, formerly needed to distribute around 2.5 million test booklets to over 46,000 schools in every part of our country. However, there are other, more substantial innovations.

Whereas every pupil of the same grade would get the same set of questions in the paper tests, the computer tests present them in different sets of items that are equivalent in terms of the skill measured and the difficulty level, taken from an ad-hoc "item bank". Thanks to the tests and pre-tests carried out in recent years on millions of young people, INVALSI now has a vast amount of data on pupils' ability to respond to the items in the bank. Statistical analysis of this "big data" makes it possible to calculate the probability with which, based on an answer to one of the test items, a pupil would correctly answer other items that appear in the item bank but not in his or her test. In a way, it is as if the pupil had answered many more questions than the ones in his/her test form. Using a statistical model, INVALSI researchers are able to construct a five-level scale for each of the skills measured in the entire pupil population of that grade and obtain a close approximation of the levels reached by the pupil examined. A level can thus be more than a number, since it becomes a description of what the pupil can do: it provides much more useful information because it gives the teacher a better understanding of the situation of each single pupil and of the class. The law states that the levels achieved must be individually certified for pupils in the third year of lower secondary school and the fifth year of upper secondary school. For other grades, INVALSI communicates instead the number of pupils in each single class that are positioned at each single level.

As other European countries that have already switched to the new system have found, the result is an even more accurate assessment of outcomes than in the past. And it will become increasingly so as new test and pre-test results will provide INVALSI with fresh data to analyse.

INDIVIDUAL CERTIFICATION

The individual skills certification is a recognition of the test results.

It does not replace the teachers' assessment and does not constitute a "second report card". This important change can stimulate a transformation of Italian schools, but it could also damage the educational pact between teachers and families if it is not well understood. The best way of avoiding this is for teachers to give a clear explanation to the families.

The legislator has ordered that, from 2018, those who take the INVALSI tests in the last year of lower secondary school, and from 2019, those who take them in the last year of the upper secondary school, will receive a certification of the level reached in Italian, Mathematics and English. The decision once again underlines – this time for the attention of families as well – the importance of acquiring skills. This innovation must, however, be explained with great clarity, so that the real meaning of this certification is not misunderstood, and families do not feel the need to exercise pressure on teachers that would, first and foremost, end up damaging their children.

As already mentioned earlier, the INVALSI tests are a valuable tool for evaluating the school system. But they only measure *some* skills among those concerned with three disciplines, to which must be added those relating to other disciplines and those concerned with educating the pupil as a person and a citizen. The certification therefore works alongside the assessment made by the teachers. It is a useful supplement but does not replace it in any way. It is not a "second report card". It should also be remembered that skills do not replace knowledge, but rather build on it. In view of the value that the law attributes to individual certification, it is important to reiterate that it may be helpful to train for this type of tests, but only as a complement to an all-round disciplinary and interdisciplinary preparation that helps each pupil to master knowledge, concepts and skills. And to use these in a way that is aware, critical and productive. Or, if we prefer, creative.

It is therefore essential that families are not taken by surprise by this innovation and are informed in good time and as much correctly as possible by the teachers themselves. In fact, a misconception could drive them to demand excessive and sterile training on "facsimile" of the INVALSI tests. Paradoxically, this could lead to negating any progress made towards an education that is not only more appropriate to our times, but which an extensive experience worldwide has shown to be the best way of involving pupils and making them, as Plutarch said, "torches to be set alight" rather than "empty vessels to be filled".

NOTES

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