

# Reading literacy among 15 year olds: an international comparative study

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***According to a survey carried out in May 2000 among students aged 15, the performance of French students in terms of their reading literacy is close to the average for OECD countries. Following this extremely generalised ranking of countries' performance, a detailed analysis of the results for France was carried out. It highlights the idiosyncrasies of the French educational system, and enables one to call these into question.***

**I**n May 2000, France took part in an international survey carried out under the aegis of the OECD. This survey focused on testing reading literacy skills among students born in 1984 across 32 countries, i.e. the entire generation of 15 year-olds in these countries. In France, students of that age either attend high school (in the eighth or ninth grades), or lycees / technical colleges (tenth or eleventh grade), or vocational colleges (see *figure 1*).

The survey put the emphasis on testing students' ability to acquire and apply knowledge rather than on their ability to retain (i.e. memorise) the knowledge itself. The skills that were tested for are believed to serve people throughout their adult lives, and the acquisition of such skills is not only a matter of schooling, but part of a life-long process. The survey therefore gave priority to the respondents' ability to apply a number of fundamental processes in a wide range of

situations, focusing on a global understanding of key concepts rather than on the accumulation of specific knowledge. A substantial part of the tests that were put to the students assessed by the survey thus falls outside the scope of French educational practices.

Reading literacy implies not only an ability to decipher and identify written words, and then apply grammatical and syntactic rules, but also, among other

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things, an ability to grasp the ambit and scope of the text, to read between the lines as it were so as to make sense of various types of texts (brochures, tables, literary texts, press excerpts, etc.) (see *box 1* for a definition of the three key skills that were tested to assess reading literacy, and *box 2* for a sample of the material used and associated questions).

In order to measure and compare the results achieved by students from various countries, a scale of scores was devised using specific statistical models (item response models – see *box 3*). The average result was set at 500 and the standard deviation at 100.

### The performance of French students was in keeping with the international average

In terms of reading literacy, French students rank close to the international average: their average score was 505, which is very close to the international average mark of 500 (see *figure 2*).

Finland achieved markedly higher results than all other countries, with a score of 546. All English-speaking countries with the exception of the United States scored highly in the survey, and the same goes for Japan and Korea. On the other hand, Germany and the countries of Eastern and Southern Europe turned in rather poor performances. Brazil and Mexico obtained the worst results with scores of 396 and 422 respectively.

In order to analyse these results in a more in-depth manner, six categories of reading literacy

aptitude were defined. Students in the lowest category (level 1) are able to read within the technical meaning of the term but find it very difficult to understand texts in a logical way and to grasp the scope and ambit thereof. At the other end of the scale, students in the highest category (level 6) are able to undertake complex reading tasks, such as scouring through all kinds of texts and extracting information that is of relevance to the task at hand, performing critical appraisal, making assumptions and solving the exercises set based on their own innate notions.

In Finland, a mere 2% of students were found to belong to the lowest category, compared with 4% of students in France, 10% in Germany and 23% in Brazil (see *figure 3*). At the top end of the scale, nearly 16% of British students were ranked in the highest category (level 6) compared with only 5% of students in Greece and Italy.

### French students: a narrow distribution of performance levels

Even with equivalent national scores, the distribution of

*Figure 1- Breakdown of 15 year old students in terms of grade and gender<sup>1</sup>*

	in %
<b>Grade</b>	
Eleventh grade	2.7
Tenth grade (high school or technical college)	48.2
Tenth grade (vocational college)	5.1
Ninth grade	36.5
Eighth grade	7.1
Other	0.4
Total	100.0
<b>Gender</b>	
Boys	48.7
Girls	51.3
Total	100.0
1. May 2000. Source : DPD, ministère de la Jeunesse, de l'Éducation nationale et de la Recherche [France's ministry of education]	

#### Box 1

#### Assessment of reading literacy skills

Three core skills were assessed: "Extracting Information", "Reading Comprehension" and "Critical Appraisal".

- **"Extracting Information"**

This involves students looking at one or more documents, drawing from these the elements that they require and organising these elements so as to achieve a given aim. At its hardest level, this skill involves being able to supply missing information.

- **"Reading Comprehension"**

This involves being able to analyse information and put it into perspective so as to for instance work out the gist of the text at hand or

the particular meaning of a sentence in its context.

The assessments carried out in France by the Ministry of Education, particularly as part of the examinations for entry into third grade, sixth grade and tenth grade primarily involve testing for these two skills.

- **"Critical Appraisal"**

Here, the reader takes a step back from the text and analyses its form and content by subjecting it to an independent, reasoned appraisal. Students are encouraged to express their views as to the content, form and presentation of the text or to look at it in the light of their own experience.

students among the various categories of reading literacy aptitude varies from one country to the next. The range of performances of French students is rather concentrated: 4% of them fall into the lowest category (level 1), compared with an average figure of 6% across all OECD countries. Conversely, only 8.5% of French students fall into the highest category (level 6), compared with over 10% for a

number of countries which achieved a similar national score (12% in the United States or Belgium for instance).

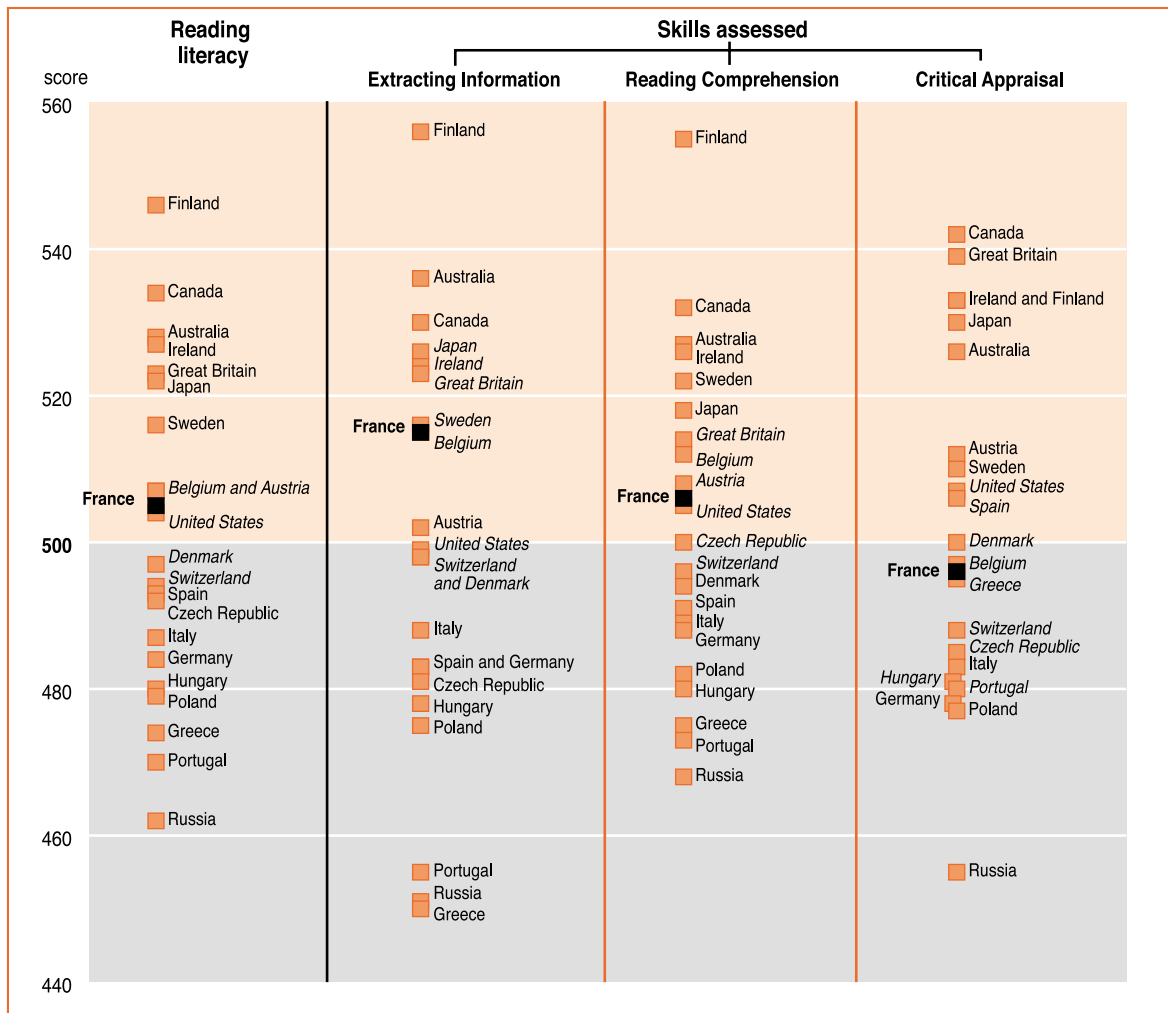
### A marked difference between the performance of boys and girls

Girls scored higher than boys in terms of reading literacy and the

gap was markedly wider when it came to providing structured answers. On the other hand, boys performed better relatively at reading graphs or tables, though they didn't outperform girls by much in this field.

In France, 6% of male students were ranked in the lowest category, compared with only 2.3% of girls. At the other end of the scale, 10.5% of girls belonged to

Figure 2 - Written comprehension scores according to the three core skills tested



This diagram ranks the countries surveyed on four separate scales : the overall reading literacy scale, and three sub-scales corresponding to the core skills assessed (see boxes 1 and 2). On each scale, the average international score is set to 500 and the standard deviation to 100. For purposes of legibility, certain countries have been excluded from this diagram (Brazil, South Korea, Iceland, Liechtenstein, Latvia, Luxembourg, Mexico, Norway, New Zealand). Countries whose names are shown in italics obtained results that are not significantly different from those of France. In the field of reading comprehension, for instance, these include Japan, Austria, Belgium, the United States, Denmark and Switzerland.  
Source : PISA international survey OECD.

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### Box 2

#### Sample text and exercises used by the PISA survey

PISA Protocol	Notes
<p><b>Acrol voluntary flu immunisation program</b>            As you are no doubt aware the flu can strike rapidly and extensively during winter. It can leave its victims ill for weeks. The best way to fight the virus is to have a fit and healthy body. Daily exercise and a diet including plenty of fruit and vegetables are highly recommended to assist the immune system to fight this invading virus.            ACOL has decided to offer staff the opportunity to be immunised against the flu as an additional way to prevent this insidious virus from spreading amongst us. ACOL has arranged for a nurse to administer the immunisations at ACOL, during a half-day session in work hours in the week of May 17. This program is free and available to all members of staff. Participation is voluntary. Staff taking up the option will be asked to sign a consent form indicating that they do not have any allergies, and that they understand they may experience minor side effects.            Medical advice indicates that the immunisation does not produce influenza. However, it may cause some side effects such as fatigue, mild fever and tenderness of the arm.</p>	<p>The “flu” text is an illustrated text, featuring paragraphs of varying density and length. Not all the paragraphs are preceded by titles and the titles themselves do not always provide an accurate summary of the information contained in the subjacent paragraphs.            It is really up to the reader to work out the status of this text. For instance, the word “you” that appears on the very first line is not immediately identifiable. In order to understand its meaning, the reader must associate it with other words in the text (the employees, members of staff, etc.). The aim of the article and its author are not clear either: the text as a whole is built on the assumption that its frame of reference (the corporate culture of the company organising the vaccination) is familiar to the reader, which of course is cannot be in the case of the student reading the text.            The text is followed by five questions two of which are designed to assess students’ “Critical Appraisal” aptitude, a third students’ aptitude at “Extracting Information” and the last two their “Reading Comprehension”.            The two exercises featured below are therefore the outcome of a conscious choice. Whilst the French and OECD samples had similar success profiles at the multiple choice question (question 1, with four choices of answers), there were marked differences in the response to the open-ended questions.            These two items epitomise the general performance of French students.</p>
<p><b>Who should be immunised?</b>            Anyone interested in being protected against the virus. This immunisation is especially recommended for people over the age of 65. But regardless of age, ANYONE who has a chronic debilitating disease, especially cardiac, pulmonary, bronchial or diabetic conditions.            In an office environment ALL staff are at risk of catching the flu.</p>	
<p><b>Who should not be immunised?</b>            Individuals hypersensitive to eggs, people suffering from an acute feverish illness and pregnant women.</p> <p>Check with your doctor if you are taking any medication or have had a previous reaction to a flu injection.</p> <p>If you would like to be immunised in the week of May 17 please advise the personnel officer, Fiona McSweeney, by Friday May 7. The date and time will be set according to the availability of the nurse, the number of participants and the time convenient for most staff. If you would like to be immunised for this winter but cannot attend at the arranged time please let Fiona know. An alternative session may be arranged if there are sufficient numbers.</p> <p>For further information please contact Fiona on ext. 5577.</p> <p>Fiona McSweeney, the personnel officer at a company called ACOL, prepared the information sheet on the previous two pages for ACOL staff. Refer to the information sheet to answer the questions which follow.</p>	

the highest category, versus only 6.4% of boys. Such differences along gender lines are not limited to France.

### Widely differing performances according to the skills being assessed

The performance of French students varied widely depending on the particular exercises set. For over 20% of the items used to

test reading literacy (29 items out of 129), France was ranked among the top five countries, whereas it featured among the bottom ten on 29 other exercises. This fact makes it clear that the overall results should be treated with caution as they represent an averaging out of a medley of divergent results and not a straight-forward and robust assessment of general skills levels.

Each of the three core skills being assessed (see *box 1*) were

allocated their own scale of scores with an absolute average of 500, so that countries might disclose better or worse performances than the overall average in each of these skills.

Although country rankings were in most cases identical from one scale to the next, a number of countries' rankings varied substantially (see *figure 1*). For instance, France was ranked above average for "Extracting information" with a score of 515. Conversely, French students overall

#### Box 2 (end)

Two questions that were put to students in connection with this text, and the results achieved by the students			Notes																					
<p><b>Question 1:</b> Which one of the following describes a feature of the ACOL flu immunisation program?</p> <p>A Daily exercise classes will be run during the winter. B Immunisations will be given during working hours. C A small bonus will be offered to participants. D A doctor will give the injections.</p> <p><b>French students' results for question 1 (%)</b></p> <table border="1"> <thead> <tr> <th>Answers</th> <th>France</th> <th>OECD</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>3.0</td> <td>6.5</td> </tr> <tr> <td>B</td> <td>70.7</td> <td>70.7</td> </tr> <tr> <td>C</td> <td>0.9</td> <td>2.4</td> </tr> <tr> <td>D</td> <td>19.8</td> <td>16.7</td> </tr> <tr> <td>No answer</td> <td>1.0</td> <td>1.6</td> </tr> <tr> <td>Spoiled answer</td> <td>4.5</td> <td>2.1</td> </tr> </tbody> </table>			Answers	France	OECD	A	3.0	6.5	B	70.7	70.7	C	0.9	2.4	D	19.8	16.7	No answer	1.0	1.6	Spoiled answer	4.5	2.1	<p><b>Question 1</b> This first item is designed to assess students' aptitude at "Extracting Information". The idea is to choose among four possible answer the one that best describes one of the aspects of the inoculation programme featured in the set text. This exercise assesses students' aptitude at grasping the overall gist of a text and drawing from it the essential ideas it conveys. Although the set text is long and contains a multiplicity of items of information that may be difficult to internalise, the incorrect choices on offer are completely unambiguous: two of them have absolutely nothing to do with the text, and the third attempts to catch students out by exploiting a blatant reading or comprehension error ("doctor" substituted for "nurse"). 70% of all the students polled gave the correct answer to this question, though one notes that the rate of spoiled answers was higher in France than for the OECD as a whole.</p>
Answers	France	OECD																						
A	3.0	6.5																						
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<p><b>Question 2:</b> We can talk about the <b>content</b> of a piece of writing (what it says). We can talk about its <b>style</b> (the way it is presented). Fiona wanted the <b>style</b> of this information sheet to be friendly and encouraging. Do you think she succeeded? Explain your answer by referring in detail to the layout, style of writing, pictures or other graphics.</p> <table border="1"> <thead> <tr> <th></th> <th>France</th> <th>OECD</th> </tr> </thead> <tbody> <tr> <td>Right answer</td> <td>26.2</td> <td>13.7</td> </tr> <tr> <td>Wrong answer</td> <td>30.6</td> <td>38.0</td> </tr> <tr> <td>No answer</td> <td>29.8</td> <td>21.6</td> </tr> </tbody> </table>				France	OECD	Right answer	26.2	13.7	Wrong answer	30.6	38.0	No answer	29.8	21.6	<p><b>Question 2</b> This question, which assesses students' aptitude at "Critical Appraisal", was one of the hardest to answer in the entire PISA protocol. Students need to be able to distance themselves from the text in order to assess the pertinence of its presentation and its suitability for its intended audience. This does not merely involve critically appraising the text itself, but also drafting a clear, lengthy and articulate answer. The results show that few students bothered to answer the question: overall, 30% of French students did not answer it. However, although a substantial proportion of French students did not attempt to answer, overall they gave fewer wrong answers than the OECD sample as a whole, which may point to a low risk-taking strategy on their part.</p>									
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performed below average for “Critical Appraisal” (with 496 versus 502). Contrast this with the performance of British students, who turned in a very high overall score for this same skill (achieving second position among all the countries taking part) but obtained a score that was rather mediocre for “Reading Comprehension”.

In theory, these skills can be easily differentiated in terms of ascending difficulty. We see this reflected in results across the board: in all the countries taking part, exercises that tested students’ aptitude at “Extracting information” elicited better scores than those involving “Critical Appraisal”. However, the complexity of the exercises set differed according to the material involved, the number of elements required, the number of criteria according to which these elements had to be selected, and the type of questions used. The combination effect of different material, exercises and question configuration thus partly invalidates the apparent hierarchy of skills in terms of difficulty.

### **The type of questions and material used help explain the average results achieved by French students**

The PISA survey supposedly used generic material so as to avoid favouring one country over another through the selection of texts used. However, looking at the reaction and performance of students in various countries in relation to the particular material used, we see a number of “sets” of countries emerge that favour specific sets of material. These

groupings negate the presumed neutrality of the materials used by the survey. French students, who performed very well in the kinds of exercises that might be set in schools (e.g. an excerpt from a play by Jean Anouilh), were far less competent at dealing with less familiar material (such as a brochure intended for the employees of a company: see *box 2*). The same applies to students in English speaking countries, who, while highly skilled at dealing with the kind of material usually used in their schools, were less successful dealing with texts that were rather remote from their normal school culture.

Also, each of the skills assessed involved the use of a different type of questions. For instance,

“Reading Comprehension” skills were often assessed using multiple choice questions; on the other hand “Critical Appraisal” skills, given that these most often involve developing a line of reasoning, featured questions calling for lengthy, structured answers. So in the latter case it might be argued that an assessment of students’ ability to internalise written texts effectively turned into an assessment of students’ ability to produce coherent written answers. Our analysis of French students’ strong and weak points appears to show that the latter’s performance was highly influenced by the type of questions used: French students demonstrated great aptitude at “Critical Appraisal” when the type of input required did not involve a structured answer.

#### **Box 3**

##### **The scales of scores used**

A scale of scores was devised using a specific kind of statistical models: item response models. These psychometric models purport to draw a probability relationship between the performance of students on a given exercise and their “skills level” as well as the difficulty of the exercise (plus other parameters that are inherent to the exercises). These two variables are not directly observable concepts: students are therefore ranked by their general scholarly level or aptitude and each exercise is ranked according to a parameter denoting absolute difficulty. Such models are useful in separating concepts: a student’s aptitude is defined independently from the difficulty of the exercise or test and conversely the difficulty of the exercise is not a function of the level of the students. Furthermore, these models rely on a fundamental assumption that success at the set exercises is only dependent on one single, uniform factor – the student’s apti-

tude – regardless of cultural or linguistic considerations. Students are ranked on a one-dimensional scale of scores that best sum up their performance. These models constitute a useful tool for building such a scale but they do not in any way guarantee the universality of the exercise. This is above all a modelling exercise.

The international average was set at 500 and the standard deviation at 100. Given the normal distribution of scores, this means that around two thirds of students will have scored between 400 and 600. This scale itself has no inherent significance: it is simply a device for ranking countries using a common denominator.

Three separate though identical scales of scores were also devised for the three core skills tested, “Extracting Information”, “Reading Comprehension” and “Critical Appraisal” (see *box 1*).

Basically, the rather passable performance of French students resulted from (1) the combined use of rather unfamiliar material for which they hadn't been trained to develop an analytical aptitude, (2) the survey's relative lack of interest in the skills honed by their

school culture, and (3) from a difficulty in expressing themselves in writing in conjunction with such skills. "Critical Appraisal", for instance, requires students to demonstrate a command of argumentation skills, critical analysis and appraisal

techniques in response to written material. Whilst these notions are broached in high school, they are most often dealt with within the scope of reading skills, i.e. internalising texts rather than self-expression. Although the curriculum calls upon teachers to

Figure 3 – Breakdown of students into the six categories of reading literacy

	Breakdown of students (in %)						Average score
	Level 1 (score of under 335)	Level 2 (score between 335 and 407)	Level 3 (score between 408 and 480)	Level 4 (score between 481 and 552)	Level 5 (score between 553 and 625)	Level 6 (score of over 625)	
Germany	10	13	22	27	19	9	484
Australia	3	9	19	26	25	18	528
Austria	4	10	22	30	25	9	507
Belgium	8	11	17	26	26	12	507
Brazil	23	33	28	13	3	1	396
Canada	2	7	18	28	28	17	534
Korea	1	5	19	39	31	6	525
Denmark	6	12	23	29	22	8	497
Spain	4	12	26	33	21	4	493
United States	6	12	21	27	21	12	504
Finland	2	5	14	29	32	18	546
<b>France</b>	<b>4</b>	<b>11</b>	<b>22</b>	<b>31</b>	<b>24</b>	<b>8</b>	<b>505</b>
Great Britain	4	9	20	27	24	16	523
Greece	9	16	26	28	17	5	474
Hungary	7	16	25	29	18	5	480
Ireland	3	8	18	30	27	14	527
Iceland	4	11	22	31	24	9	507
Italy	5	14	26	31	19	5	487
Japan	3	7	18	33	29	10	522
Latvia	13	18	26	25	14	4	458
Liechtenstein	8	15	23	30	19	5	483
Luxembourg	14	21	27	25	11	2	441
Mexico	16	28	30	19	6	1	422
Norway	6	11	20	28	24	11	505
New-Zeland	5	9	17	25	26	19	529
Poland	9	15	24	28	19	6	479
Portugal	10	17	25	27	17	4	470
Czech République	6	11	25	31	20	7	492
Russia	9	18	29	27	13	3	462
Sweden	3	9	20	30	26	11	516
Switzerland	7	13	21	28	21	9	494
<b>OECD</b>	<b>6</b>	<b>12</b>	<b>22</b>	<b>29</b>	<b>22</b>	<b>9</b>	<b>500</b>

The data should be read as follows: 10% of German students belong to category 1 (the "weakest level") and 9% of them belong to category 6 (the "strongest level").  
Source: PISA international survey, OECD.

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impart argumentation skills from the sixth grade onwards, the results of this survey would appear to indicate that this particular aptitude is only really dealt with come the tenth grade, a supposition that can only be confirmed by surveying teaching practices.

French students were thus being tested for skills that they had not thus far been exposed to in the case of those who were still in ninth grade, or that they had just begun to touch upon in the case of those in tenth grade or above.

### **Limitations of international surveys in terms of assessing educational skills**

Like most other previous international surveys, the PISA survey raises questions as to whether the performance of students in different countries is truly comparable (see *box 4*). This kind of survey is liable to be invalidated by cultural bias, by the effect of translation or by the fact that the educational systems surveyed are differently structured (school curricula, diversity of approaches). After all, the survey, which basically consisted of a single 'one size fits all' test translated into all the languages of the countries involved, could not be supposed to suit all the countries involved. The validity of such surveys is compromised by their supposed "universality".

In order to deal with these difficulties, the European Union, as part of the Socrates programme, has pioneered an alternative methodology involving testing all students using material that is devised in their own country and is therefore not translated. This

#### **Box 4**

### **The advantages and limitations of international surveys purporting to compare the performance of students**

Since the late sixties, fifteen international surveys have been carried out to assess students' relative performances. The aim of these surveys was to compare the various educational systems of the countries taking part in terms of the results obtained. They measured the performance of students directly and addressed various issues such as the effectiveness of the educational practices of the various countries taking part. Most of these surveys were spearheaded by the International Association for Assessment of Educational Achievement (IEA). The OECD was particularly interested in the relationship between per capita educational expenditure and the achievements of students, and it is in order to shed some light on this question that the PISA (Programme for International Student Assessment) survey was devised.

France has taken part in a number of these surveys. Although the interpretation of the results of these international comparative surveys is fraught with pitfalls, they are unique in being able to instil a measure of reflection and action beyond the reach of merely national approaches. This is because purely national assessments are themselves in some way the product of the educational system whose effects they purport to measure. They therefore tend to favour certain types of material and questioning. Although they do manage to distance themselves from their domestic educational system, they most often focus on the practices found in this or that reference school. OECD countries have widely differing educational practices that show up in the international survey's results as strong and weak points. By assessing students with material they are not used to it is possible to highlight the nature of these strengths and weaknesses (and thus to get an

idea of the validity of the know-how and skills transmitted). Furthermore, apart from any consideration of the pertinence of the answers they bring, international surveys reveal differing behaviour on the part of students when confronted with various sets of exercises, behaviour that is worth analysing. For instance, French students' tendency not to answer certain questions may not have been picked up by a national assessment, but was blatantly revealed by the PISA survey.

All the exercises put to the students surveyed were supposedly the outcome of a compromise between the countries taking part in the survey. However, in spite of all the progress made over the years in measuring educational indicators and in spite of all the care taken in translating the exercises and setting guidelines to correct students' answers, some of these exercises may raise questions in terms of comparability between countries and so-called cultural bias. Some of them may also inevitably be more or less closely related to the kind of exercises commonly used in certain educational systems.

The overall structure of the PISA survey appears relatively distant from that of the French educational system. Yet although this may sound paradoxical, it is precisely for this reason that it should be looked at closely by the political patrons and the key players in this educational system. By analysing the results and comparing them with those of other countries, it will be possible to question the validity of the aims of the French educational system (should we take another look at the relative importance that we attach to developing given skills?) and the practices thereof (for instance, do we give enough priority to developing written argumentation skills?).



removes a significant amount of bias in the measurement of their respective skills. A trial run conducted in 1999 confirmed the merits of this approach, but further, more in-depth studies are needed in order to develop a set of reliable indicators. It should also be said that using this methodology makes it harder to develop a single scale by which to rank different countries, and such surveys will therefore not have the same media impact as that carried out by the OECD. ■

#### For further information

**Bourny G., Dupé C., Robin I., Rocher T.**, “Les élèves de 15 ans. Premiers résultats d’une évaluation internationale des acquis des élèves [Initial results of an international assessment of 15 year old students’ aptitudes (PISA)]”, *Note d’information*, DPD, no. 01.52, December 2001.

More detailed results from the PISA survey will soon be available in DPD’s *Les dossiers* reports series.

OECD, “Connaissances et compétences : des atouts pour la vie. Premiers résultats de PISA 2000 [Knowledge and aptitude: skills for life. Initial results of the PISA 2000 survey]”, Paris, 2001.

For further information about the PISA survey, consult the OECD’s Web site on [www.pisa.oecd.org](http://www.pisa.oecd.org)

