Report on organizing the ROSE survey in France

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1. ROSE team

The French ROSE team consists of Dr Florence Le Hebel (Associate Professor in the Institute for Teachers Training), Dr Pascale Montpied (Senior CNRS Researcher), Professor Andrée Tiberghien (Senior CNRS Researcher), Valérie Fontanieu (statistician in the National Institute of Pedagogical Research) and Dr Jacques Vince. We are all located at University of Lyon, in the Ecole Normale Supérieure in the Department of Science Education.

2. School system and science teaching

The French school system proposes an access to school (free) since age 3 and a free and compulsory education from 6 to 16 years old. Children may thus start at school at age 3 (which is the case for the quasi-totality of the pupils) or at the latest they start at age 6. Schooling is divided into three types of school: primary school with grade 1 to 5 and lower secondary school called "college" from grade 6 to 9 and upper secondary school called "lycée" from grade 10 to 12. Pupils have to repeat a year if their scholar development is not in conformity to the expected level as defined by the national institution. This is rather frequent, then 15 year old students can be either at "college" or at "lycée".

During the 12-years (grade 1 to 12) the curricula defined nationally begin to refer specifically to sciences instruction only at the level of grade 3. Until 2001, and thus for the cohort of 15 years old pupils interrogated for the ROSE study 2007-2008, "Sciences and technologies" do not have specific time in the instruction from grade 3 to 5 but must be included in other parts of the curriculum in particular in geography, civic instruction and history which, weekly teaching ust represent 4 hours. A survey conducted in 2001 (Loarer C., Inspecteur général de l'éducation nationale) for the French minister of education reports that teachers in average spent weekly 1 hour 27 minutes for sciences and technologies teaching. Moreover it appeared in this survey that the proposed themes that should be coveredduring primary cycle and that include biology, chemistry and physics might not be entirely treated for all pupils. Since 2002, specifically for 2 hours 30 minutes weekly of scientific education and mention that the teaching should open up toward the ethical matters as: economical development, health and environment. The pupils interrogated for the 2008-9 ROSE might thus have rather poor education in primary cycle about sciences and its links with health, or environment

In college (intermediate secondary school), pupils received 1 hour and 30 minutes of life and earth sciences and 1 hour and 30 minutes of technologies from grade 6 to 10, and 1 hour and 30 minutes of physic and chemistry from grade 7 to 10. National curricula specified that during college 30 to 40 hours of sciences should be spent on health and education to sexuality (for the later subject 3 hours /year), but in contrast there was no specific instruction on teaching sciences of the environment within the teaching time devoted to sciences of life and earth. More emphasis are put on environment in the newest (2006-2007) college official curriculum, however the pupils interrogated did not follow this curriculum.
In lycée (upper secondary school) there is three types of scholar institutions offering different perspectives: professional, general, and general & techniques. Sciences curriculum in these various types of orientations are highly variable and for the grade 10, students sample was, of course carefully balanced by the statisticians. However, we will not enter in the details since the survey took place in december and each teacher may or may not have treated a subject and also because it represents few hours and should have a rather minimal influence on the attitudes interrogated in the ROSE survey.
Information about the French school system is available from http://www.education.gouv.fr. In France, there is no streaming or grouping of pupils according to ability or gender, etc., but we have a rather important number of private schools where teaching of a particular religion is added. Some alternative educational approaches may be the fact in private as well as public school but are marginal as a choice of an entire school. There are a few special schools for deaf children and children with very weak abilities, but most pupils with special learning needs are integrated in ordinary public school. There is not, in France, scholar policy for the various ethnic groups and French language reinforcement is proposed for children having foreign origins. However since the Bulletin Official n°10 and 13 published in 2002, recently immigrated children (age 12 to 16) may, following an evaluation, be directed toward CLA (classe d'accueil = welcome classroom) where they will receive for one year specific reinforcements on various aspects of knowledge taught in the French scholar system, prior to reintegrate a standard French curriculum at the grade that seems appropriate.

3. Translation

In September 2007, we developed the French version of the ROSE questionnaire. In the French translation we have been careful at keeping the sense of the questions as close as possible from the English version and the wording as simple and clear.

4. National questions

- additional background questions concerning home (parents education or occupation, etc.)
- additional survey questions

We added background questions concerning home as well as questions interrogating attitudes about taught sciences perceptions (mainly derived from the OECD Programme for Student Assessment PISA questionnaire). Those were presented as new series located at the end of the questionnaire:

J. Me and my strategy for learning Sciences

To what extent do you agree with the following statements? (Likert scale)

1. When I study for a science exam (Biology, Geology, Physics/ Chemistry), I start to evaluate the situation about what I need to learn.
2. I work better in sciences when I work with others.
3. If I do not understand anything in sciences, I look for further informations.
4. Usually, this is not necessary to have understood everything in science class to get a correct score.
5. When I study my science lesson, I try to memorize exactly the maximum of things.
6. I learn better in sciences, if my objective is to be better than the others.
7. When I study, I try to link what I learned in the others subjects.
8. I prefer working alone in sciences, thus the score represents better my value.
9. When I study my science lesson, I try to understand better things by connecting what I learn to what I already know.
10. If I o not understand anything in my science lesson, I look for help.
11. When I study my science lesson, I repeat it as much as I can
12. I have many difficulties to know what to do if I do not understand something in sciences.

K. Me and my family about (concerning ?) technologies and Sciences

To what extent do you agree with the following statements about your work in sciences? (Likert scale)

1. My parents like to know what I do in science class.
2. My parents are especially pleased when I succeed in sciences
3. My parents are interested by sciences (TV reports, radio, magazines...)
4. In my family, we discuss science.
5. My parents have a job in connection with science.

How many books are there in your home ?

At home, is there any ? (answer by Yes or No)

- an internet connection
- your own bedroom
- a dishwasher
- a DVD player
- a desk to study
- a quiet room to study
- your own calculator
- books to help you in your homework
- a dictionnary

How many of these objects are there in your home ? (none, one, two, three or more)

- mobile phone
- television
- computer
- car
- bathrooms

Which languages do you speak at home ? (open ended)

In which language do you watch TV ? (open ended)

What profession would you like to have when you are grown up ? (open ended)

L. Me and my confidence in my work in sciences

To what extent do you agree with the following statements about your work in sciences? (Likert scale)

1. When I succeed in sciences, my self-esteem is boosted
2. Even when I have good scores in sciences, I do not think that I really understand well
3. In sciences class, I feel able to understand and solve problems, even difficult ones.
4. To succeed in sciences is a question of chance.
5. I have personal knoweldge in sciences and they enable me to be better than others
6. I feel lost and resourceless when I have to solve problems in Sciences.
7. When I sit at my table deciding to learn something really difficult in sciences, I achieve it.
8. In sciences, whether be it to answer to tasks (activities, exercices …) or to exams, I am very anxious.

We added two new questions in the survey::

F. My science classes

17. I give as much or more importance to my results in sciences than those in other subjects.

18. School teaches me generally things which interest me.

For the initial "C 14 item" of the English version, we did not exactly add a new question in the survey, but we split it, following students interviews. The survey was pilot tested on a sample of students who were then interviewed right after completion in order to evaluate the comprehension, interpretation etc… and thus, the survey was completed prior to the final study. It appeared that several students were puzzled in front of the C14 item and could not answer because they considered witches and ghosts totally different matter. To avoid the risk of an absence of response we add a 19th item and modified the 14th.

C. What I want to learn about

We changed the question 14 "Ghosts and witches, and whether they may exist" in two questions:

14. Ghosts and whether they may exist
19. Witches and whether they may exist

5. Piloting

When we had available the first French translation of the final version, it was tested by 19 pupils who filled the questionnaire. We performed a none directive interview on eight of them. We wanted to test:

- the time required to answer the questionnaire including national added questions.
- the understanding or misinterpretation of the questions, and globally what they thought about the questionnaire.

It took pupils around 45-50 minutes to answer. Most of them asked the same questions about words they did not understand (ex: gems), but globally they did not show any difficulty to answer.

In November 2007, we brought the questionnaire to a close for the French version.

6. Official permission

In June 2007, we introduced ROSE project and the questionnaire to a team from the French ministry of Education (DEPP: Direction de l'Evaluation de la Prospective et de la Performance). We requested a representative sampling of the French pupils, 15 years old in all the country. We also obtained funding to support the project.

As we planed to ask the pupils to fill the questionnaires on line, we needed the official permission of the CNIL (Commission Nationale de l'Informatique et des Libertés). We obtained it easily because questionnaires were anonymous.

7. Population

The ROSE target population in France was the cohort of 15 year old French pupils, living in our country in 2007. As repeating a year is common in France, our school classes sampling had to be done in two grade levels where most 15-year old pupils were likely to be. Thereby, we sampled classes in the grade level 9 in secondary school and grade level 10 in high-school. The age average is 14.8 year old in ROSE French study.

8. Sample and participation

The French Ministry of Education has the review of all schools and school statistics in our country. In order to obtain a sample representative of the disparities in French schools, they defined 9 different layers, taking into account the following criteria:

Private/public; secondary school/high school; general or secondary school for vocational training class at level 10; ZEP or not (ZEP= Zone d'Education Prioritaire, means area targeted for special help in education).

For each layer, they chose randomly schools in the database, and for each school, they chose randomly one class. DOM TOM Schools (overseas departments and territories), French schools in foreign countries and special schools were not in the database. In total, 126 schools have been selected.

In October 2007, the French ministry of Education sent a letter to all selected schools explaining that they support the ROSE project.

In November 2007, we sent letters to the 126 sampled schools and invited them to participate in the ROSE survey. We send them a copy of the questionnaire and a letter of instructions to make the pupils fill the questionnaires on line. We initially let them a lapse of 4 weeks in December to accomplish our demand.

At the beginning of January, we called back all the schools that did not participate, and let them extra time (two weeks) to answer.

Finally, 104 schools answered and we obtained 2124 filled questionnaires. This gave us participation on school level of 83 percent, which we as an overall positive attitude towards participating in the survey. As we do not know the exact number of pupils in each school class, we cannot report the participation percentage on the level of the pupils.

One school reported that for practical purposes they conducted the survey in another parallel class than the one suggested in our instructions. But besides this single feedback, we assume that the instruction sent were strictly followed and that if difficulties or arrangements had to be made the schools would have informed us.

Statisticians applied statistical corrections to restore the statistical representativeness of the 104 responding schools. They affected a weight for each student, based on the ratios (1) number of students who answered in the class/ number of students in the same grade of this class in the school and (2) number of schools in the defined layer/ number of schools in this same layer who answered. Thus, the sample could be considered as being representative for the French target population.

9. Data collection in schools

Apart from four schools in Lyon, and one school in Toulon (this last one had problems to get a connection), all the schools did the questionnaire on line. The data were collected on a server at the INRP using the software Modalisa and were as well converted in an excell format. For the data collected on paper they were manually enter on the main file of the collected data. The 94 students of the four Lyon schools that filled the questionnaires were asked to put their names in order that we could proceed to interviews with some of them.

10. *Coding (also of the open-ended I question)*

The whole time the connection was set and allowed the access to the questionnaire in order to fill it, we checked each morning the answers, to exclude all questionnaires that did not look seriously answered (for example, entire pages empty…) or that have been double-stored (students probably clicked more than one time when they valid their questionnaire).

These are all the identified variables, you can find in the data excel file.

N° (student identified number)
VAR1 (school number)
SEX
AGE
A01 à A48
B01 à B26
C01 à C19 (question C19 added)
D01 à D18
E01 à E42
F01 à F18 (questions F17 and F18 added)
G01 à G16
H01 à H61
J01 à J12 (questions added)
K01 à K05 (questions added)
J
K06 à K19 (questions added)
L01 à L08 (questions added)
W (student statistical "weight"- see part 9)

Answers have been numbered from 1 to 4 according to Likert scale. The value 5 corresponds to the answer " no opinion". When there was no answer, we did not put any value.

For the open-ended questions, we are coding the answers at the moment. We inform différent parameters of the answer. For example, concerning the response made to the question on career projects we have, for the time being, decided to code: 1- the "presence" or "absence" of the expression of a will; 2- then if the student expresses a competence (e.g.: electrician) or a function and grade (e.g.: boss);3- then if he indicates a domain (e.g.: health, economy…); 4- finally if he says something about where he imagines it (e.g.: abroad, in the public institutes or the private…). The data are thus coded on table with 4 columns where a yes is noted 1 and a no noted 0. The imaginary scientist works and their reasons are similarly analyzed, but we may try to reduce the number of parameters we have fixed presently.