
Information Literacy in Students Entering Higher Education in the French Speaking Community of Belgium: lessons learned from an evaluation

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Abstract

Although universities are providing more and more information literacy training for their undergraduate students, the students' real level of information literacy at the beginning of their studies has never been assessed. Hence EduDOC has decided to team up with the CIUF 'Library' Commission in order to organize a wide study aiming at objectively describing this initial level of information literacy, at identifying the students' main weaknesses, as well as allowing instructors to adjust their training on this basis. The questionnaire was based on a similar study carried out in Québec and contains 20 questions grouped in five themes relating to information search steps. It was sent in September 2007 to a random sample of students entering a higher education institution in the French Speaking Community of Belgium for the first time. The students' rather poor results confirm that organizing an information literacy program is imperative if students are to perform well in their studies.

Keywords: information literacy; university students; evaluation; French language; Belgium

Introduction

Going to a library or even having a library in a school clearly influences the students' school results, as was demonstrated already in 1990 (Line 1990; Lance 1994; Lance et al. 2004). Moreover several scientific studies, e.g. Todd (1995), more recently Poll (2006) and Zmuda and Harada (2008), as well as Coulon in France (Coulon 1997; Coulon et al. 1999), have shown explicitly that the students' success in college is partly linked to their skills in retrieving information. Those studies have yet to be confirmed (Thirion 2004).

While their computer skills are developing clearly and at an ever younger age, students are still unable to retrieve valid, quality information that can support their assignments during their undergraduate studies. As this ability to be critical and independent in the search for information seems to be the one asset needed for students to succeed in college, several head librarians in higher education have created proper information literacy training, which is often part of the curriculum (Pochet 2004).

As the objective initial level of the students' information skills is not known, the instructor can only use his subjective perception of their levels. In order to objectively describe the students' levels, the 'Library' Commission of the CIUF (Interuniversity Council of the French Speaking Community of Belgium) and the EduDOC Group decided to assess the students' levels when they entered higher education in the French Speaking Community of Belgium. This study also allows international comparisons.

This study was based on a 2002 Québec survey organized by CREPUQ (Conference of Rectors and Principals of Québec Universities) and headed by Diane Mittermeyer and Diane Quirion (Mittermeyer and Quirion 2003; Mittermeyer 2005). The aim of the Québec survey was first to determine incoming students' information literacy skills so as to identify their needs and to provide more appropriate services, and secondly to provide university libraries with reliable data to support recommendations for the integration of information literacy courses into the university curriculum.

The Québec study targeted students entering fifteen universities in Québec (twelve French-speaking and three English-speaking), i.e. about 40,000 students. During July 2002, 5381 questionnaires were sent by regular mail to students, who had the opportunity to win a PC or Palm computer if they filled out the survey – not a negligible incentive.

The questionnaire was elaborated in French and in English and was based on the process of information searching defined in five steps. It contains 20 questions grouped under five themes (Table 1) and one area for open comments.

The CIUF-EduDOC Survey

When setting up this survey, the CIUF ‘Library’ Commission and the EduDOC Group were following four main objectives, some of them similar to the Québec survey:

- to gain objective information about the information skills of students entering higher education in the French Speaking Community of Belgium
- to allow instructors to confront their subjective perceptions with the objective reality measured by the survey
- to identify the students’ weaknesses so that instructors can offer proper training
- and finally to make comparisons at an international level with Québec, but also, when their results are available, with the six European countries (Austria, Denmark, Finland, Greece, Italy and Sweden) which are also using the Québec questionnaire within the framework of ENIL (European Network for Information Literacy) although limiting their study to a few disciplines).

The board of the EduDOC Group decided to carry out the survey in January 2006 and to include all the higher education institutions (including art education). The CIUF ‘Library’ Commission quickly joined the project (February 2006).

Working Hypotheses

We identified seven major hypotheses to be assessed in the survey:

1. The performance level of first-year students entering higher education in the French Speaking Community of Belgium is very low. It is no different from the students’ level in Québec.
2. Information literacy level of university students does not differ significantly from that of students in other higher education institutions.
3. Having an Internet connection at home impacts the students’ performance level, and this impact cannot be reduced to the socio-economic background of the family.
4. Being a user of a library or a documentation center during secondary school increases the performance level.
5. The performance level is independent of the choice of studies.
6. The performance level is independent of the time needed to access higher education.
7. Selecting a ‘strong’ school option (6 hours or more a week) at the end of secondary school influences the performance level, whether the orientation be in mathematics, science, second language, or French (mother tongue).

Questionnaire

In order to allow comparisons with the Québec situation and in order to answer the first hypothesis, we barely modified the original questionnaire (available in both English [p.77] and French [p. 87] in Mittermeyer and Quirion 2003, available online at <http://crepuq.qc.ca/documents/bibl/formation/>

studies_Ang.pdf. The changes were rather adaptations to the Belgian context (the words ‘Canada’ were replaced with ‘Belgium’, and ‘Tremblay’ became ‘Tolkien’, a character more familiar to francophone Belgians). For each of the 20 questions of the questionnaire, respondents had to choose among multiple-choice responses. For the first sixteen questions, only one answer was to be chosen; for the last four, multiple responses were possible and expected. For these four questions (nos. 17 to 20), the response was considered as ‘good’ if all the correct answers were selected. The students’ performance level is measured in terms of the number of correct responses given to the 20 questions, and may thus range from 0–20.

Table 1. Themes and questions of the survey (from Mittermeyer and Quirion 2003).

1. Concept Identification	4	Significant words
	8	Significant words
	13	Significant words
2. Search Strategy	2	Translation into keywords
	9	Boolean operator ‘OR’
	11	Search indexes
	12	Controlled vocabulary
	16	Boolean operator ‘AND’
3. Document Types	3	Encyclopedias
	15	Periodicals
	20	Scholarly journals
4. Search Tools	1	Databases
	6	Search engines
	7	Library catalogues
	14	Metasearch engines
	17	Library catalogues
5. Use of results	5	Reading citation
	10	Bibliographies
	18	Evaluation of information (Internet)
	19	Ethical use of information

To be able to verify the various hypotheses, preliminary questions were added. They aimed at defining the student sample (school orientation, secondary education history, parents’ education, Internet connection at home, etc.), but the questionnaire remained strictly anonymous. Finally the questionnaire layout was modified so that it could be read automatically and optically (OMR), which speeded up the data collection and minimized the risk of transcription errors. The detail of the French questionnaire used can be viewed in the summary report of the study at: <http://www.bsa.ulg.ac.be/edudoc/www.edudoc.be/synthese.pdf>.

A pretest was conducted in September 2006 with around 100 students, who were given slightly modified versions of the survey. The students were also interviewed individually so as to pin down possible comprehension problems. The questionnaire layout was consequently improved.

Collaborations

In March 2007, a letter was sent to all the directors of universities and higher education institutions to present the study and to request their participation approval. In some cases the request was backed by

‘pool’ leaders, an association grouping higher education institutions (universities and others) inside a geographical area.

All together 31 institutions agreed to participate: eight of the nine universities, eighteen of the 26 higher education institutions, two music schools, two art colleges, and the Royal Military School. This participation rate was extremely satisfactory, all the more that the participating institutions had to take on some of the expenses (mailing the questionnaires to the students selected in their institutions). It reflected the institutions’ concern about their students’ success and the strategies that can be put in place to improve this success. The information supplied by our questionnaire was of real interest to them.

Methodology

One contact person was designated in each institution in order to coordinate the survey locally. The sampling method was also defined so that the sampling was similar in all institutions: random selection of one first-year student entering higher education out of five in the alphabetical registration lists as of 17 September 2007.

To increase the participation rate, an incentive was added: the students could win one sponsored PC if they answered the questionnaire and their name was drawn.

The questionnaire was sent by mail to the students’ residences between 30 September and 15 October, i.e. early enough to avoid the risk of students being exposed to information literacy training in their institutions. The envelopes contained an explanatory letter signed by the rector or president of the institution, the strictly anonymous survey form, an envelope with ‘postage paid by the recipient’, and a participation form to win the PC. The deadline to send back the survey was November 2007.

In some institutions some slight procedure differences were observed: in one of them the questionnaires were handed out to the students instead of being mailed; in another, the questionnaires were filled in while the students were gathered in a lecture hall. Other institutions or parts of institutions did not have enough information about the students’ backgrounds and could not identify, in the preselection, true first-year college students from those who had possibly spent one year in a different higher education institution prior to enrolling in their institution. However the questionnaire had been designed so that false first-year students could be removed at a later stage. Finally, one smaller institution that nevertheless wanted to have specific results requested to send the questionnaire to all first-year students so as to have enough answers for the statistics.

Sample Description

The response rate was particularly satisfying – probably due to the attractive incentive – since 1868 out of the 4388 questionnaires sent were returned, i.e. a 42.57 percent response rate (in Québec the response rate had been 56.9 percent). During the control stage 150 questionnaires were removed from the sample because they had been filled out by students who had already enrolled in a previous higher education institution and thus did not meet the ‘first-year student’ definition. Moreover, three questionnaires were removed because they were not properly filled out (mostly no answers or random answers not complying with the instructions) and only reflected the students’ desire to win the raffled computer. After the validation procedure the number of questionnaires taken into account was 1715, i.e. a real participation rate of 41.2 percent for universities and 36.2 percent for other higher education institutions and art schools.

The average age of responding students was 18 years and 10 months, and the majority of them (93.2 percent) had studied in a secondary school in the French Speaking Community of Belgium.

It is not possible to claim that the sample is perfectly representative of all first-year students in higher education in the French Speaking Community of Belgium. Some elements are, however, reassuring. First more than two out of every three higher education institutions and eight out of nine universities participated in the survey; they respected the random selection procedure rigorously and

had a high response rate. According to the latest available official figures from the Conseil des Recteurs francophones de Belgique (CREF) and Ethnic (the general IT service of the Education Department of the French Community of Belgium)¹. The 985 university students who took part in our survey represent 6.0 percent of the 12,798 first-year university students. For the remaining students 716 questionnaires were validated, representing 3.7 percent of the 19,577 first-year students mentioned in the Ethnic statistics for 2003–2004.

The students' distribution in various university study programs indicated in our survey is similar to the CREF statistics (Figure 1), though with a higher proportion of students in life and applied sciences and a lower proportion in social, economic, or political science.

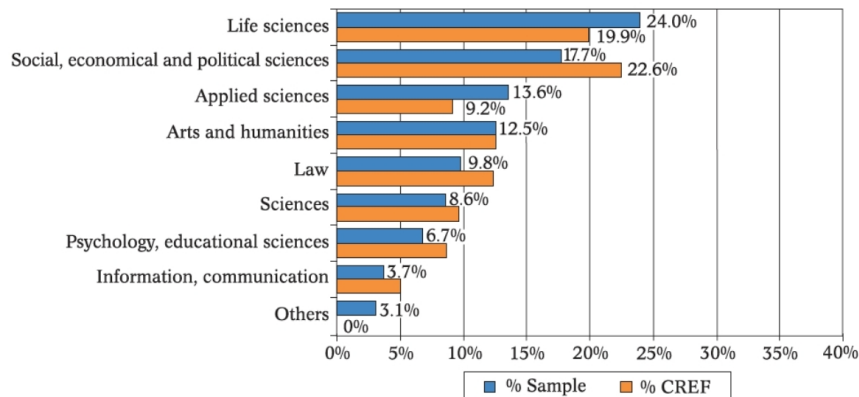


Figure 1. Comparison by orientation between the sample and CREF data (university first-year students).

Performance Level and Socio-Economic Background of the Family

As recommended in the literature, the socio-cultural background of the students' families was assessed on the basis of the mother's educational level. This allowed linking the students' performance level with the Socio-Economic Background of their Families (SEBF).

The students' performance means, measured in terms of the number of correct responses to the questionnaire, ranged from 6.7 for students whose mothers did not graduate from elementary school to 8.5 for those whose mothers who graduated from university after 4 or more years (Figure 2).

1. Statistics for 2006 from the CREF (Council of Frenchspeaking Rectors of Belgium) and statistics for 2003–2004 from Ethnic (general IT service of the education department of the French Community of Belgium)

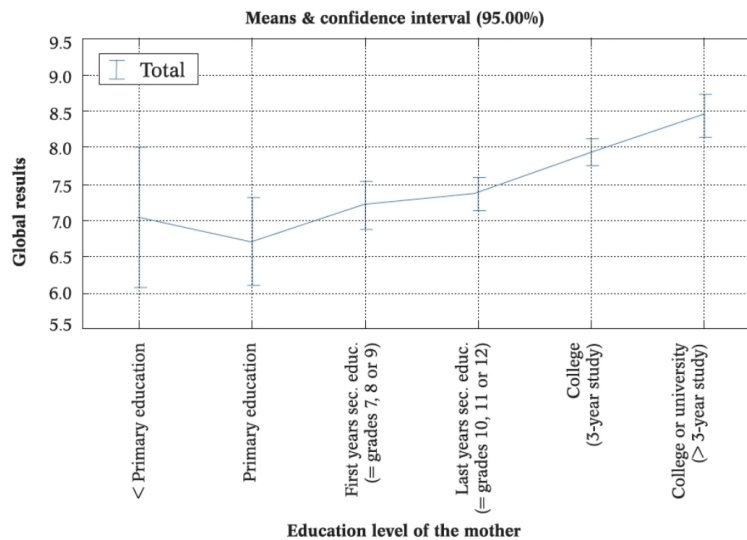


Figure 2. Mean line graph in relation with the education level of the mother.

The analysis of variance shows a statistically very significant difference in the results of students according to their mother's level of education ($p < 0.0000001$). A post hoc test (Scheffé) indicated that having a mother who was educated at the level of university studies (associate or bachelortype degrees) made the biggest difference. The SEBF thus plays an important role in the students' information literacy. It should be mentioned that the fathers' education level gives similar results but with a smaller range of difference.

Hypotheses Assessment

Hypothesis 1: The Performance Level of Firstyear Students Entering Higher Education in the French Speaking Community of Belgium is Very Low. It is no Different from the Students' Level in Québec

As noted above, the performance level of individual students was measured in terms of the number of correct responses to the 20 questions on the questionnaire. The mean of the results for all the participants is called the 'global mean' to the questionnaire and is very low, with a global mean of 7.67/20 and a perfect Gaussian distribution (Figure 3).

A high proportion – 92.8 percent of all the students – scored less than 12 out of 20 – which is often considered as the minimum grade to pass a course. The global mean is 1.3 percentage points lower than that in the Québec survey. If only university students are taken into account, this difference is still present, but is reduced to 0.84 percentage points. One explanation for this could be the difference in the students' history. In Belgium, students enter university right after graduating from secondary school (6 years). In Québec, after graduating from secondary school (5 years), students attend two years of preparatory school (Collège d'enseignement général et professionnel – Cégep), where they may receive information literacy training.

An 'uncertainty rate' was calculated on the basis of "no answer" and "I don't know" answers. The mean uncertainty rate is 12.23 percent. The same calculation applied to the Québec survey data indicated that Québec students not only answered more questions correctly, but also with more certainty (uncertainty rate: 10.53 percent).

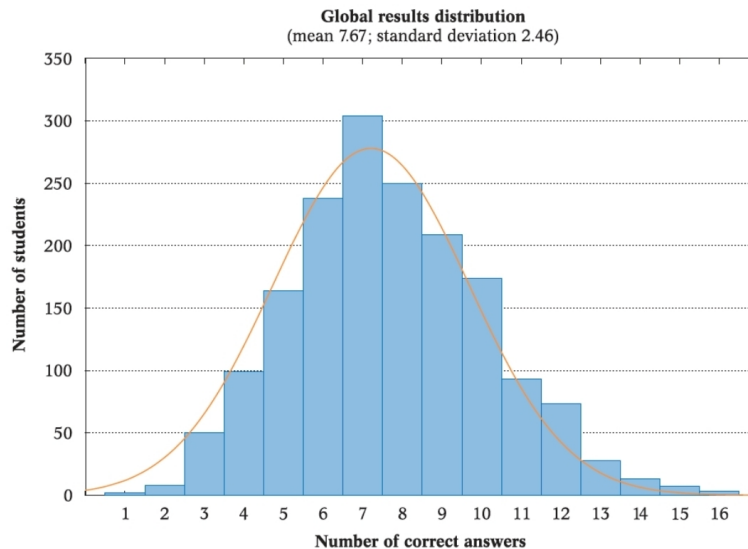


Figure 3. Students' distribution based on correct answers.

If we compare the results in Belgium and in Québec regarding the themes (Figure 4), we see that the result-based ranking is similar. The best known themes are 'Concept Identification' (same as Québec students) and 'Document Types' (with Belgian students performing slightly better than Québec students). The remaining three themes confirm that the Belgian students' level is very weak and significantly lower than the Québec students' level (differences ranging from 7 to 14 percent). The least successful theme was 'Use of Results'.

Hypothesis 2: The Performance Level is not Significantly Different in Universities and Other Higher Education Institutions

Both distributions are normal. The mean performance level of the 985 university students is 8.13 with a standard deviation of 2.46, while for the 716 non-university students the mean is 7.05 with a standard deviation of 2.32. A student's t test to compare the means (Figure 5) indicates a very significant difference between the two groups ($p < 0.0000001$).

The performance levels of the two groups are thus significantly different and this goes against our hypothesis. Nevertheless the range of the difference between the two groups is limited since it is only a little more than 1 percentage point. Multiple regression analysis reveals that the difference cannot be explained by the mother's socio-cultural background (measured through her educational level).

The same difference can be observed when it comes to the various themes (Table 2).

Hypothesis 3: Having an Internet Connection at Home Impacts the Students' Performance Level, which is not Entirely Dependent on the Socio-Economic Background of the Family (SEBF)

Although a vast majority of students entering higher education have Internet at home (94.2 percent responded positively to the question), a statistical comparison remains possible (n high enough, normal distributions, and variance homoscedasticity).

The performance mean for students having an Internet connection at home is 7.68, whereas it is 7.56 for those not having a connection (Figure 6). The mean comparison test reveals that there is no significant difference ($t = 0.43$; $p = 0.665$). Thus, having an Internet connection at home does not improve the students' performance. The possible link with the SEBF is irrelevant.

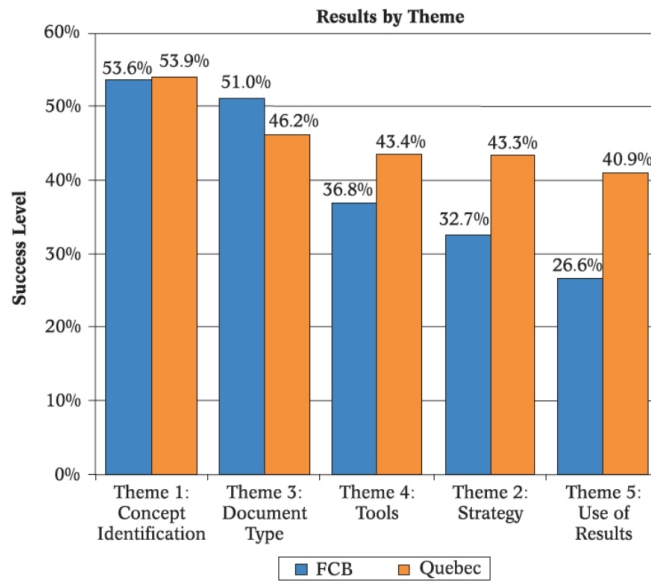


Figure 4. Mean performance level ranked by theme for Belgian and Quebec students.

Hypothesis 4: Being a User of a Library or a Documentation Center During Secondary School Increases the Performance Level

A first observation is comforting: students – at least those who later register in college – seem to go to a library more regularly than expected. Indeed 51.1 percent of the sample students declared they went to the library at least four times a year during their secondary studies, while 20.7 percent even answered that they went more than 10 times a year (Figure 7).

It is remarkable that the average performance in the survey increases with the number of times students went to the library in secondary school (Figure 8). The average performance mean ranges from 7.13 for students who never go to the library (group A) to 8.24 for those who go more than 10 times a year (group D). The variance analysis shows that this influence is very significant ($p < 0.0000001$).

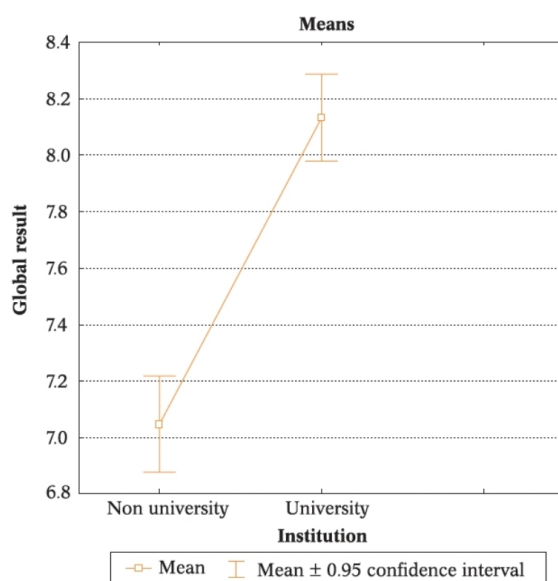


Figure 5. Mean graph for university and non-university students.

Table 2. Comparison for each theme between university and non-university students.

Variable	Mean others	Mean univ.	<i>t</i> value	Id	<i>p</i>	<i>N</i> others	<i>N</i> univ.	<i>SD</i> others	<i>SD</i> univ.
Theme 1	1.483240	1.698477	-5.40699	1699	0.000000	716	985	0.828512	0.797256
Theme 2	1.455307	1.760406	-6.02057	1699	0.000000	716	985	0.973473	1.072312
Theme 3	1.441341	1.591878	-4.82228	1699	0.000000	716	985	0.700186	0.584292
Theme 4	1.780726	1.884264	-2.23675	1699	0.025432	716	985	0.877516	0.987115
Theme 5	0.886872	1.197970	-7.23556	1699	0.000000	716	985	0.824313	0.910863

Hypothesis 5: The Performance Level is Independent of the Choice of Studies

One of the preliminary survey questions requested students to indicate in a list of 10 categories which higher studies they had chosen to pursue.

The variance analysis shows that this variable has a very significant impact ($p > 0.0000001$). The performance level is thus not independent of the choice of studies (Figure 9).

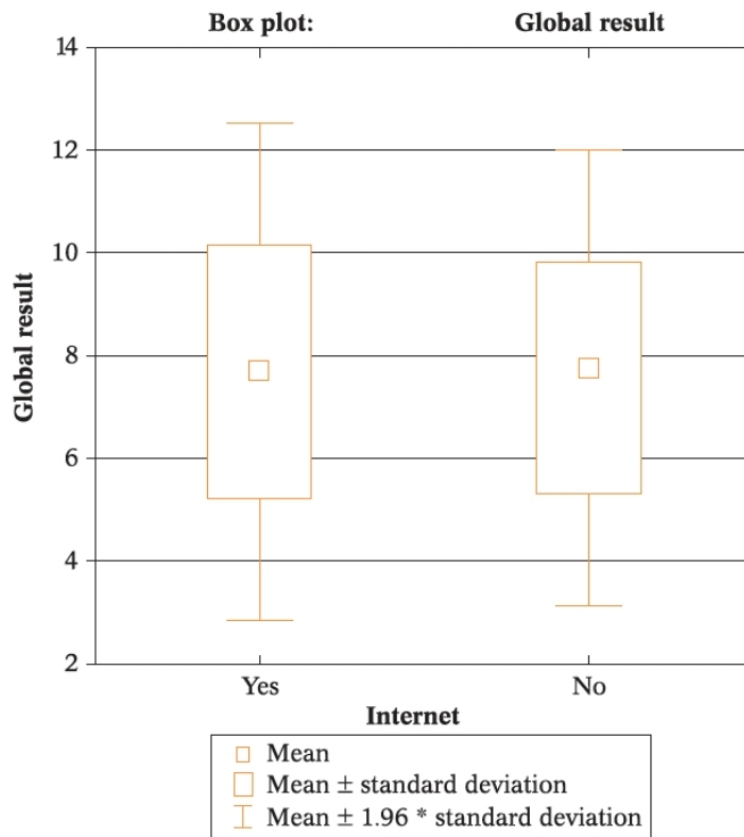


Figure 6. Comparison of means between students who have Internet at home and those who have not.

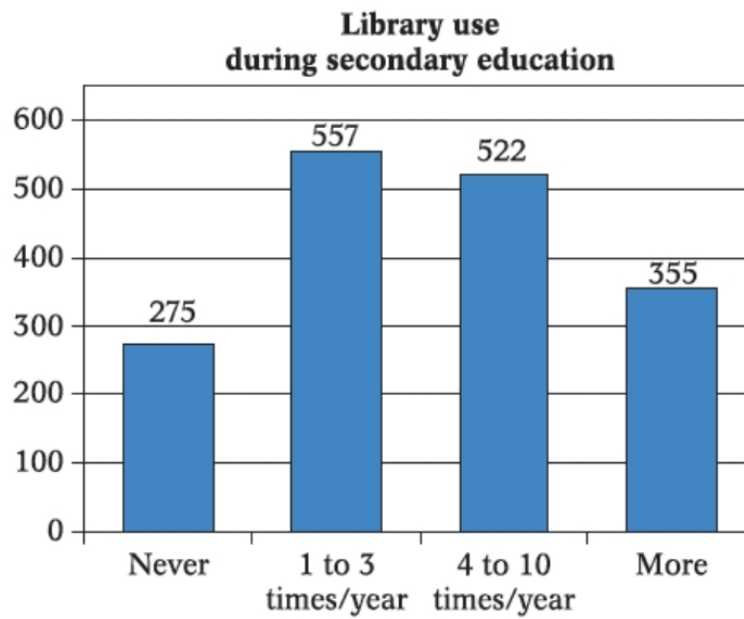


Figure 7. Students' distribution based on the number of times students went to the library during secondary education.

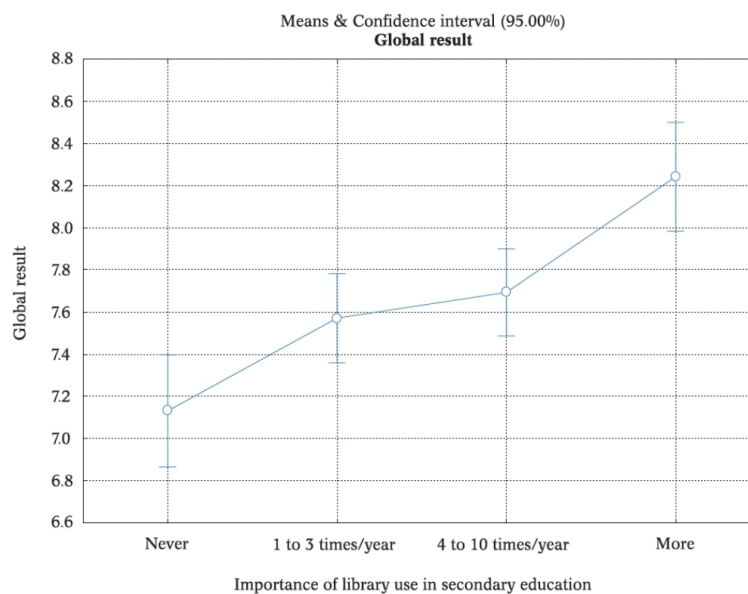


Figure 8. Link between the results and the number of times students go to the library during secondary education.

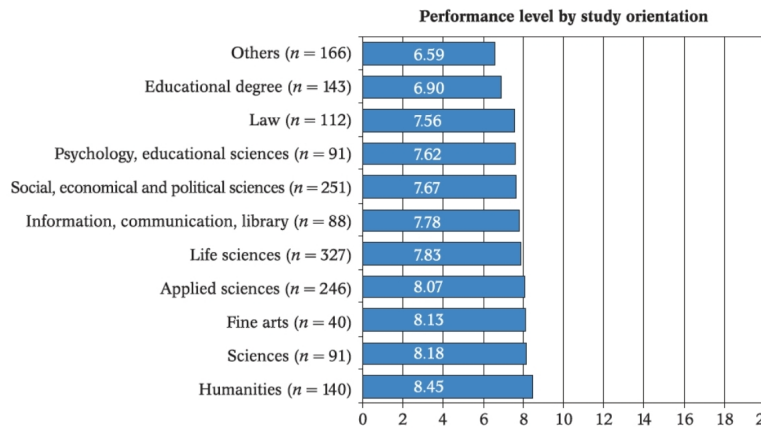


Figure 9. Mean performance level by choice of studies.

On average, students who choose to study history, philosophy, or languages start their studies with a much higher information literacy level (8.45) than those (elementary and middle school teachers) who begin education degrees (6.90). Fortunately the latter group now receives a 15-hour information literacy training program, as part of the curriculum, which was made compulsory through a ministerial decision in 2000.

Hypothesis 6: The Performance Level is Independent of the Time Needed to Access Higher Education

We did not take into account the time between graduation from secondary school and the beginning of university studies as some students spend that time abroad. Apparently 69.1 percent of students graduated from elementary and secondary school without failing any grade (with 3.7 percent of students even being ahead of their grade).

However, 29.9 percent (513 students) had to resit at least one time during secondary school, and three students were up to five years behind their peers.

The variance analysis shows that the time taken to complete primary and secondary education successfully has a very significant impact (Figure 10). We cannot draw conclusions from the very limited number of students who were in extreme situations (three students who were five years behind their peers, three who were two years ahead, and one who was three years ahead of their peers), but in general the performance level seems to be linked to the number of years needed to graduate from secondary school.

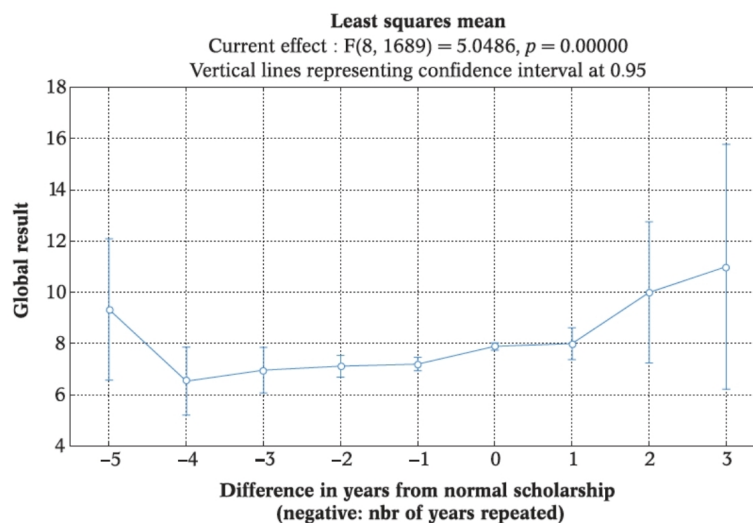


Figure 10. Mean graph illustrating the time needed to access higher education.

Hypothesis 7: Selecting a ‘Strong’ School Option (6 hours or more a week) at the End of Secondary School Influences the Performance Level, Whether the Orientation be in Mathematics, Science, Second Language, or French (mother tongue)

During their studies, students in the French Speaking Community of Belgium can customize their schedules so as to receive more or less instruction in certain topics. A weekly 6-hour course is considered as a ‘strong’ school option.

Comparing the performance means (Table 3) shows that students who chose a ‘strong’ Latin option in the final year of secondary school performed significantly better than the others in the survey. The same holds true for those who selected a science or mathematics ‘strong’ option.

Table 3. Comparisons of means for each "strong" school option.

‘Strong’ school option (≥ 6 h/week in final year of secondary school)	Concerned students (%)	Mean	Différence	Statistical signifiante
Latin	3.3	8.82 (vs 7.63) *	1.19	$p = 0.000377$
Mathematics	36.7	8.24 (vs 7.34)	0.90	$p < 0.000001$
Science	41.3	7.96 (vs 7.47)	0.49	$p = 0.000062$
French (mother tongue)	5.1	8.12 (vs 7.6)	0.52	$p = 0.076837$ Not significant

(*) The mean for students who did not select that orientation is between parentheses.

A multiple regression analysis confirms that the mathematics option has the most impact, followed by Latin and language arts. The science option, however, does not significantly impact the model.

Figure 11 shows the mean increase in the results, depending on the weekly number of hours of mathematics instruction attended by the students. Even if we ignore extremes (very small numbers) we clearly see that the performance in the survey is linked to the number of hours of mathematics instruction attended in secondary school.

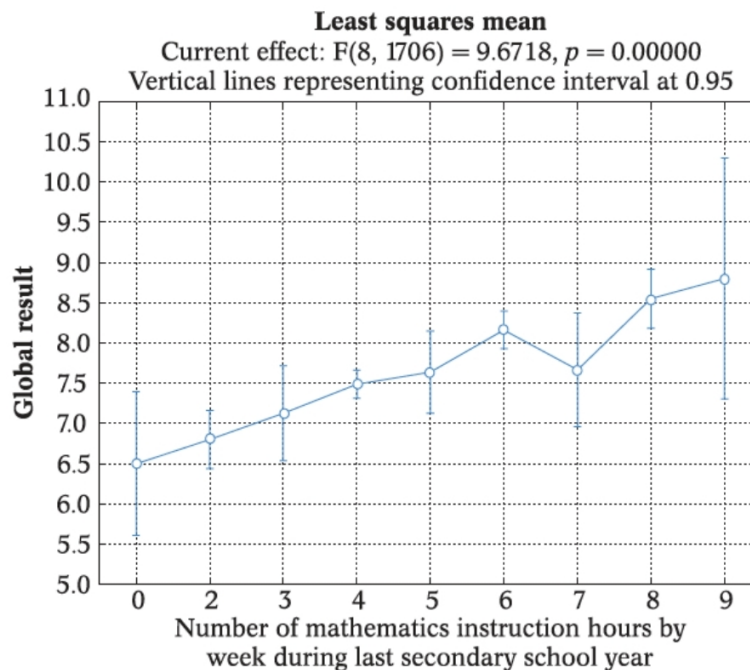


Figure 11. Mean graph illustrating the students’ mathematics instruction.

When we have a look at the number of ‘strong’ school options selected by the students, we clearly see that 42.6 percent of the students never had a ‘strong’ school option in the final year of secondary school, 29.6 percent had one such option, 26.6 percent even had two, and 1.2 percent claimed to have had three (20 students).

Here again the variance analysis (Figure 12) shows a very significant effect of the variant ($p < 0.0000001$). Having one ‘strong’ school option in the final year of secondary school increases the performance, having two is even better.

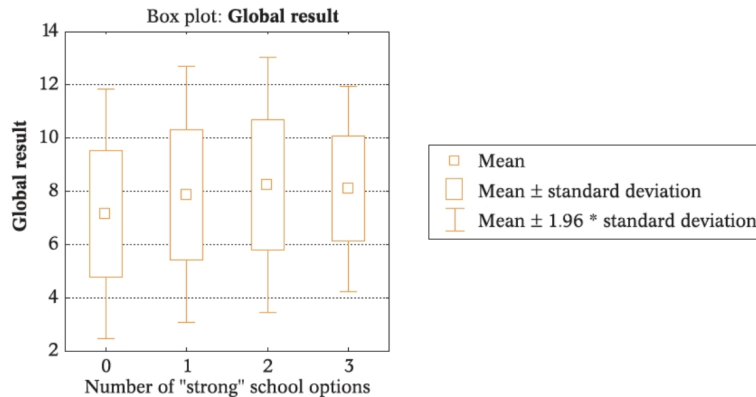


Figure 12. Comparison of means depending on the "strong" school options selected in secondary school.

Analyses by Themes and Questions

Globally the various questions can be classified into two groups (Figure 13): The questions that yielded mostly incorrect answers (less than 35 percent of correct answers) and those that yielded mostly correct answers (more than 55 percent of correct answers). Extremes are particularly distant since they differ by up to 85 percent of correct answers (Question 1 and Question 15: their results will be developed in theme 3 and 4).

Similarly a great difference is to be noticed in the level of uncertainty. It is extremely low for some questions but incredibly high for others – beyond 50 percent for questions 12 and 14.

Theme 1: Concept Identification

The three questions in this theme offered various combinations of keywords among which the students had to select the most appropriate association. This was the most successful theme, with a global performance mean of 56.3 percent (Figure 14). The very low rate of uncertainty proves that the students were confident about their answers in this theme. However one question yielded many fewer good answers (26.1 percent) than the other two. This can probably be explained by the students’ poor grasp of the word ‘effet’ (effect), an empty word that many students keep on using in their search. The results are close to those obtained in Québec (34.7 percent, 64.3 percent, and 62.8 percent).

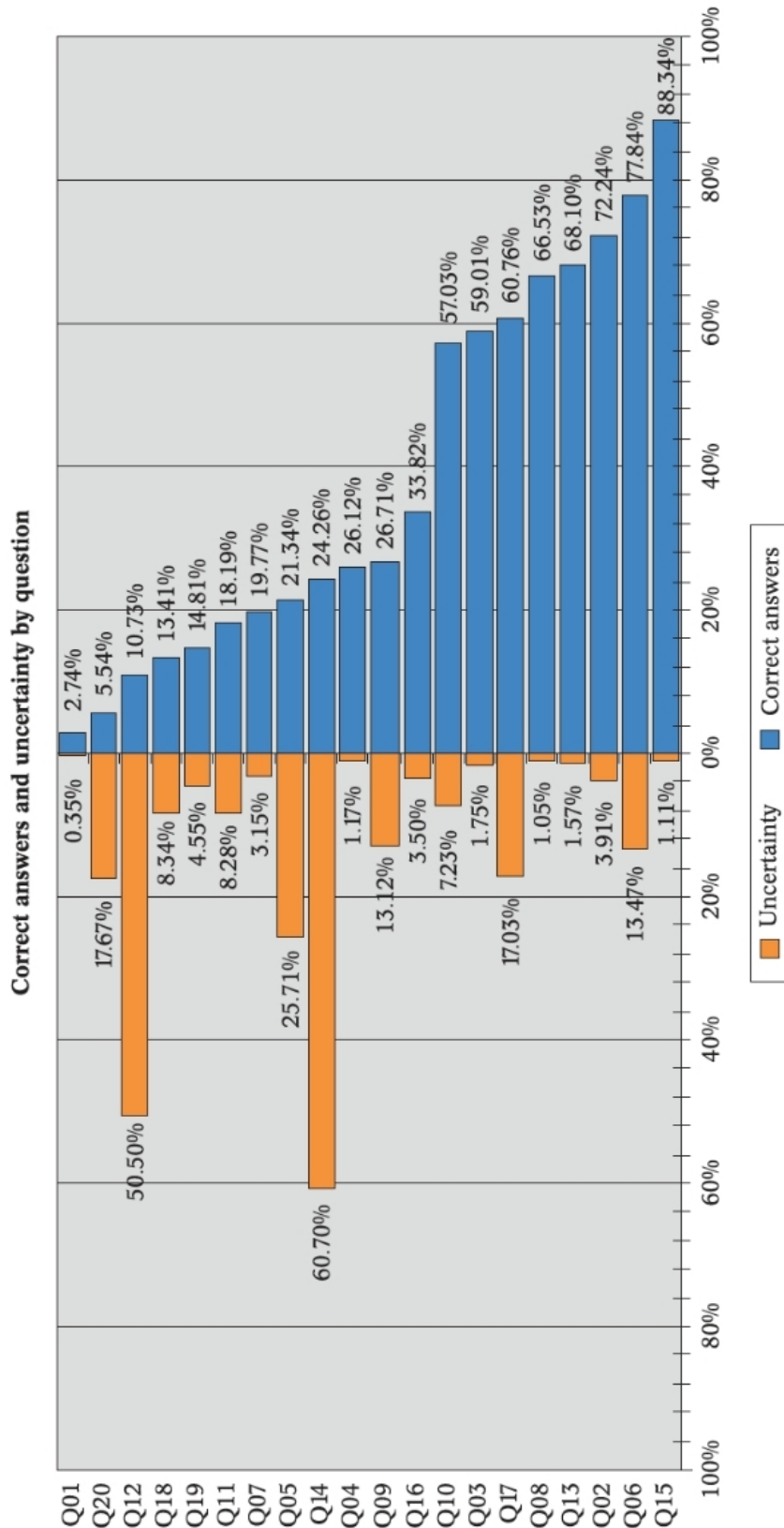


Figure 13. Ratio of correct answers and uncertainty level for the 20 questions.

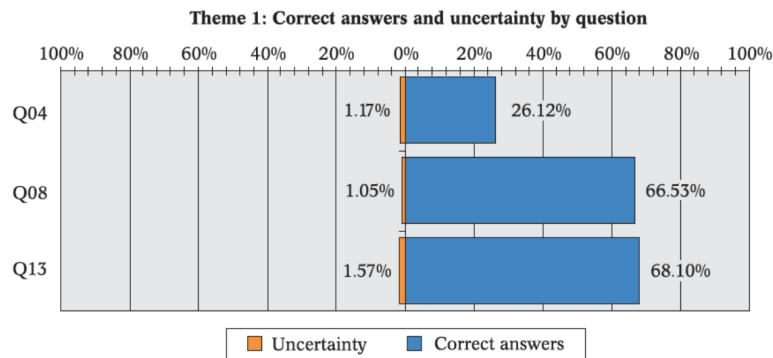


Figure 14. Ratio of correct answers and uncertainty levels for theme 1.

Theme 2: Search Strategy

In this theme (Figure 15) Question 2, which involves translating concepts into keywords, yields the best results (72.4 percent). This is also true in the Québec survey (85.8 percent). The question that yielded the lowest proportion of correct answers was Question 12, a question about controlled vocabulary and thesaurus (10.7 percent vs. 12.6 percent in Québec).

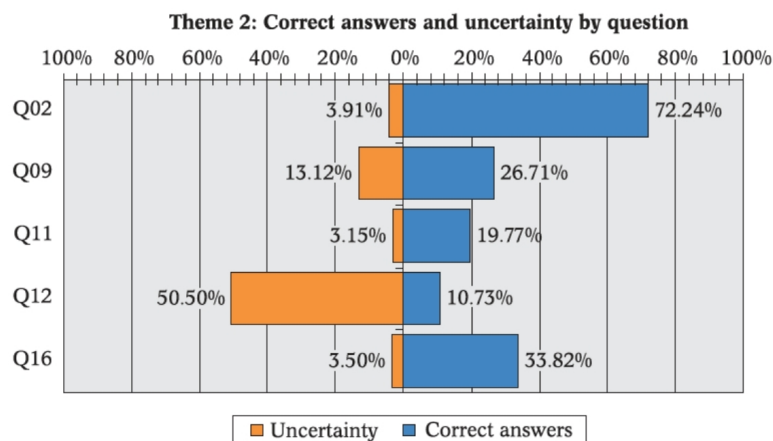


Figure 15. Ratio of correct answers and uncertainty levels for theme 2.

Most students do not know the meaning of a technical term such as ‘thesaurus’ when they enter higher education, and a high level of uncertainty (50.5 percent) confirms this. This theme also underscores how poorly students use Boolean search operators. For Question 9 about the ‘OR’ operator, the percentage of correct answers is only 26.7 percent (27.5 percent in Québec). For Question 16 about the ‘AND’ operator, the percentage of correct answers is 33.8 percent, much lower than in Québec (61.1 percent). We are appalled to see that such a basic operator is so little known by students. The responses to Question 11 also reveal the Belgian students’ lack of comprehension of the various indexes available in regular search tools (confusion between the Author and Topic indexes). This was even more obvious in the Québec survey (29 percent).

Theme 3: Document Types

Periodicals (Question 15) and encyclopedias (Question 3) are well known (88.3 and 59.0 percent respectively), seemingly even better than in Québec (73.7 and 50.0 percent). However the specific characteristics of scholarly journals (Question 20) are hardly known (5.5 percent of correct answers), and the rate of uncertainty is high (Figure 16). More than one third of those answering the question confused scholarly journals with broad-audience scientific magazines. In Québec students seemed to recognize the characteristics of scholarly journals better (14.0 percent).

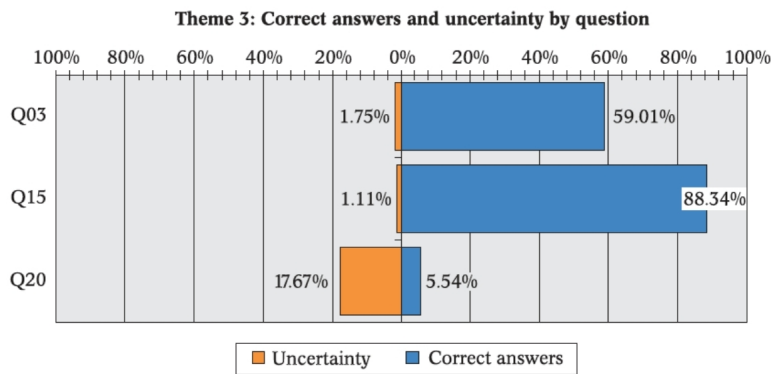


Figure 16. Ratio of correct answers and uncertainty levels for theme 3.

Theme 4: Search Tools

This theme covers the main search tools (Figure 17). As could be expected, the best-known tools (77.8 percent) are search engines (Question 6). On the other hand metasearch engines (Question 14) yield fewer correct answers (24.3 percent) with a very high uncertainty level (60.7 percent) – in fact the highest uncertainty level of the study. The percentage of correct answers to this question is much lower than in Québec (52.4 percent).

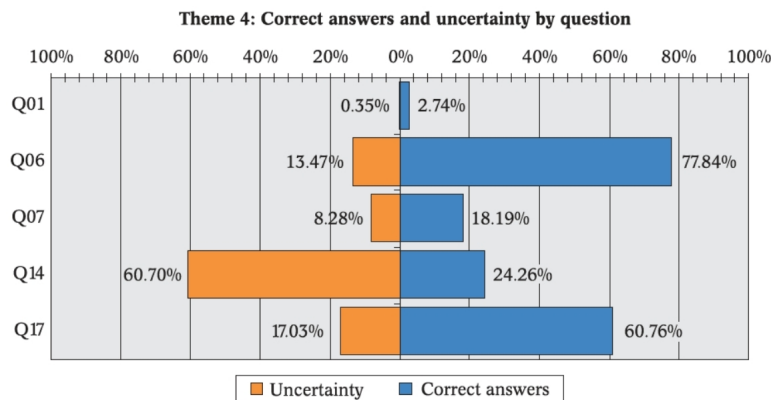


Figure 17. Ratio of correct answers and uncertainty levels for theme 4.

The catalog function ‘to find a book’ (Question 17) was properly understood by 60.8 percent of students, but the method of using it efficiently (Question 7) was less obvious.

Finally the basic notion of ‘bibliographic database’ (Question 1) is totally absent (2.7 percent) – the lowest score in the whole survey. Yet the uncertainty level nears 0, which proves that the students wrongly assumed that they know the answer. In this question, students were expected to retrieve a journal article first in a bibliographic database, but most of them firmly suggested to use Google or Yahoo, or to consult magazines or even television programs. This concept was better understood by Québec students (28.0 percent).

Theme 5: Use of Results

This theme yielded the least proportion correct results of the survey (Figure 18) with only a 26.6 percent average (vs. 40.9 percent in Québec). The role of bibliography (Question 10) seems to be understood (57.0 percent vs. 77.7 percent in Québec), but the correct interpretation of bibliographical references (Figure 18), which is a more academic competence, remains vague (21.3 percent with an uncertainty level of 25.8 percent).

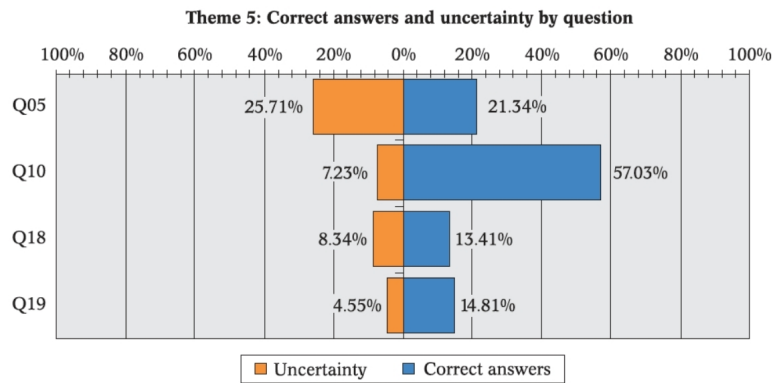


Figure 18. Ratio of correct answers and uncertainty levels for theme 5.

Criteria for the assessment of Internet information (Question 18) are also hazy (13.4 percent vs. 22.9 percent in Québec). Over 15 percent of responding students indicated that the speed of accessing an Internet website is proof of quality! Finally students hardly know the concepts of ethics and copyright (Question 19). Only 14.8 percent of students know that they should always mention their sources (27.4 percent in Québec).

Additional Comments

The questionnaire gave the possibility to add a personal comment after answering the questions. 217 students (12.6 percent of the sample) used that section (25 percent in Québec).

Beside eight students' comments mentioning their wish to win the computer (!), the comments can be classified in four main groups.

'Positive' to 'very positive' opinions were recorded by 56 percent of respondents, among whom one third (40 students) said that the questionnaire helped them to realize how weak their information literacy was, expressed the wish to have information literacy training in secondary school or in higher education, and suggested to improve library and information access as well as to hand out guidebooks or manuals.

Twenty-three percent of students commented on their personal practice in information retrieval, which could explain their low information literacy level (use only Internet, no access to a library in secondary school, believe the help of a competent person is enough, etc.).

Rather negative comments were made by 17 percent of respondents (38 students), in that students found the questions difficult or even claimed that they had wasted their time by filling out the questionnaire.

Four percent declared that they would have to go to the library now that they have entered a higher education institution and that this will condition their success in their studies.

Conclusions and Perspectives

Even if the results should be interpreted with caution because of the questionnaire-based methodology, they nevertheless indicate that the information literacy level of students entering higher education in the French Speaking Community of Belgium is low – even lower than that of the Québec students. The interpretation of these results needs to be in line with the objectives pursued when the questionnaire was designed. Under no circumstances should they be used to draw hasty conclusions or to stigmatize students entering higher education by labeling them as 'hopeless' or 'incompetent' – as some media have quickly done. Our objective with this baseline is to measure the gap between the performance level expected of students when they enter higher education and their real level, so that appropriate

training policy can be decided and thus allow students to meet the sometimes implicit requirements of higher education.

Our survey thus confirms that students generally trust the Internet to perform information searches. They know that the selection of appropriate vocabulary is necessary, and they also have a basic knowledge of several simple tools and documents. However they ignore or cannot use other critical tools, such as Boolean operators, confidently and lack understanding of other more specialized notions that are rather academic skills (thesaurus, scholarly journals, bibliographical lists, etc.). They have a naïve and erroneous, sometimes even dangerous, conception of the organization and functioning of the main information tools (Internet search engines, catalogs, bibliographical databases, etc.). Finally they have not learned to respect the basic principles of copyright or to have a critical approach to information.

A certain number of factors with a significant incidence on the students' information retrieval performance were isolated, such as the socioeconomic background of the family or some elements in the students' school background. Acting to change the students' education or family background is very difficult, if not impossible. However, acting at the society level – by setting up libraries and encouraging students to go to the library – is both possible and desirable, since actively using library resources significantly impacts the students' information literacy level. Unfortunately little importance is given to school libraries in the French Speaking Community of Belgium. The belief that having an Internet connection at home is enough to magically improve the level of information literacy turns out to be wrong, probably because this Internet access does not come together with the right preparation or guidance.

These results confirm that an important effort in information literacy training is mandatory if students are to perform at the expected level in higher education. This training should focus on search strategies and use of results; these two fields seem to be the most challenging. Specialized tools should also be at the core of the training since they are critical in higher education studies and, above all, in university studies.

We are not trying here to set the Internet in opposition to the libraries' own information resources. The objective is to be sure that each student, each citizen, has the possibility to use all the available quality information most efficiently and most critically, regardless of its form, both in libraries and on the Internet, in order to use it successfully.

We believe this effort should start in secondary school, where having a computer laboratory with an Internet connection is simply not enough. Students need to be prepared as early as possible in order to navigate the huge mass of information, whose codes and characteristics are unknown to them. Also they need to be trained to be critical by comparing different sources and by giving them tools to assess their relevance.

The questionnaire used in the survey only reveals a part of the needs in terms of information literacy. To complete the data we need to assess in practical terms the students' perceptions of their own needs, as well as those of the professors. Finally, it is essential to describe objectively the competences that are really needed to perform pedagogical tasks. As we know, the need for autonomy and efficiency in information retrieval and use, which is explicitly stated by some educators or in some institutions' pedagogical projects, is not always required in practice.

Thus we have to look at the activities that require information skills, assess the information literacy training that is given to complete these activities and to meet the requirements, and make sure that the training covers real needs. In order to be efficient, information literacy training should not be added artificially and abruptly to the study program, as many authors have already shown. The training has to fit the students' real needs, which could question the sometimes too exclusively transmissive character of teaching activities in higher education.

Information literacy training should preferably be organized at different points in the curriculum to respond to the students' effective and specific needs. Those needs evolve greatly between the moment when the students enter higher education and the time when they are ready to write a thesis. Also the training should be planned as a partnership between the teacher and the librarian, so that both can

bring in their specific knowledge. Generally the teacher alone does not have a complete mastery of the advanced specificities of information tools and techniques. And the librarian alone also cannot help the students with the core competences required for specific topics. However, the relevance of combining both has already been proved.

With this survey a baseline has been drawn, which can lead to further developments. Nevertheless it needs to be confirmed by more studies. It would also be interesting to assess the students' competences at the end of the cycle with the same tools so as to provide us with complete data about the issue. With these data we could measure the students' progress throughout their studies, with or without specific information literacy training. In case training has been given, we could then improve it and even determine the best practices.

To conclude, a refined version of the questionnaire ought to be designed so as to identify some problems more precisely, such as the students' critical sense towards information and their way of using online resources.

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