

Scuola Media Statale “E.Lepido” – Reggio Emilia

14th - 15th - 16th December 2000

1. Overall view

The Institute "Marco Emilio Lepido" is in Via Premuda 34 in Reggio Emilia, in the suburbs nearest the town which is capital of the province. The Internet address is:

<http://progetti.webscuola.tin.it/multilab/rege03> (Telephone and fax: 0522301282 - 0522300221. E-mail: lepido@tin.it). It is a state junior secondary school. There are 332 students enrolled (147 boys and 185 girls) aged between 11 and 14. The school has a total budget of about 27 million lire, 18% of which is invested in ICT. The school is mainly funded by the state but also by local authorities and private people. The staff working in the school is composed of 59 people. Teachers have on average 21 lessons per week and each lesson lasts 50 minutes. The courses start on 11th September 2000 and finish on 8th June 2001, with 35 lessons of 50 minutes per week. Each week is made up of 6 days. The Institute has decided that different subjects must be taught in parallel classes. Marks, which are formative but can also be summed up, are given considering both finalities and parameters that have been fixed. There are no standard tests. The course is divided into two periods of four months. Marks will be given within these two periods and extra-exams will not take place. There are 29 multimedia computers in all, two of which are directly connected to the Internet. They are in two laboratories for students (one of which is connected to the Web), in the planning room for teachers as well as in the laboratory devoted to disabled.

Starting from the school year 1998/99, the school has been conducting a research which has led to the creation of a "teaching organizational model". This model is functional to the concrete realization of innovative pedagogical requirements. The school knew that this innovation could not be managed by single people, so it started to follow a path of reflection in order to create an organization allowing it to sustain effectively the pedagogical renewal; it was about building up the bases, laying the foundations of a new educational project. This project was focused on enlarging the formative offer in order to guarantee to the students both tailored paths allowing skills strengthening as well as the possibility of overcoming specific difficulties, and paths for working groups that are able to break the compelling bounds of the group-class, thereby allowing teaching to more classes simultaneously.

Within the organizational and educational autonomy, the teaching staff first of all decided to reduce the length of time of the lessons from the traditional 60 minutes to 50 minutes. This reduction was decided in order to combine two different needs. The first was to ensure the learning of the essential knowledge concerning those subjects which are peculiar of the junior secondary school. The second need was to save some time to devote both to diversification and enlargement of the educational offer. The change lying beneath these innovations is of great importance. We meant to put aside a school based on bookish and rigid learning paths, where communication meant just transmitting data, for the adoption of a system made up of several paths and different educational opportunities. These opportunities had not to be incidental, but clear, targeted, recognizable in their diversity. Virtually, we needed to create a fertile ground for education, addressed to a variety of brains and focused on a way to communicate which was not only passive but also collaborative, based also on the use of new technologies.

Once we saved some time, an essential resource, we needed to find another resource as important as the first one, i.e. the human resource. Considered from this point of view, the secondary school "Lepido" had the opportunity to be one of the 68 schools to be asked by the Ministry of Education to try a new organizing instrument for the arrangement of the teaching staff, that is the "Organico Funzionale di Istituto" (OFI) - Functional Staff of the Institute. Therefore, the school has had a number of teachers higher than usual and an amount of hours fixed on the basis of its new needs. It is important to say that the new organizational and educational model requires to our teachers extra working time whose only return is in terms of personal satisfaction within the educational framework.

Finally, the needs of the school concerning the equipment used to work have been met only because of the funds allocated by the Ministry of Education through the project "Multilab". The participation to the project allowed the school to be equipped with multimedia laboratories and to start training teachers for the use of ICT. The new organizational

model envisaged to activate all the compulsory curricular subjects and optional laboratory subjects in the morning, while limiting to the afternoon the project "open school", based on some optional activities in association with external institutions.

The morning course is organised into 30 lessons of curricular activities and into Laboratories: L1, L2, L3, L4, L5. The classes are composed of monolingual and bilingual students attending together the curricular activities while splitting off during laboratories. Monolingual students study Italian, as mother tongue, and only one foreign language (English), while bilingual students study English and French.

The laboratories L1, L2, L3, are used by monolingual students, while bilingual students attend the lessons concerning the third community language. The characteristic of the activities and contents of those laboratories is the possibility to make single interventions, arouse enthusiasm, propose effective working methods, support collaborative learning opportunities. The laboratory L4 can be considered an educational opportunity that break the stiffness of the group-class thereby meeting the need of enhancing the sphere of expression, of experiencing operative approaches, of enlarging the net of interpersonal relations. The L4 is one of the optional laboratories whose target is to enhance the sphere both of expression and creativity. They were designed to work with more classes simultaneously and can be used by all the students of the Institute. During the year students have to choose two laboratories. Their target is to give each student the opportunity to express himself or herself within areas he or she has more affinity with. The laboratory must allow each student to test himself or herself, in order to make his or her attitudes surface while enhancing a better self-knowledge. For bilingual students, attending laboratories (L5) means to have the possibility to acquire transversal multimedia skills, that can be used as new knowledge instruments, in particular associated with English and French languages. Monolingual students can use the L5 as a methodological laboratory to improve their way to communicate, to enhance their enthusiasm towards learning as well as to improve their studying method. Afternoon activities are an opportunity both to enlarge students interests and to develop their rational and expressive skills, thereby strengthening the educational guiding aspect. It is about optional activities requiring a steady commitment whose target is to be a centre of aggregation and a point of reference both for students and their families. Some of these activities are organized in association with external organizations, such as for example with sports companies, or with other schools through the telecommunications network in order to start students off to the learning of Spanish and German languages.

2. The past

The fundamental project of school innovation is included in the 1997 ministerial decree establishing school autonomy. On the basis of that decree a Project and Monitoring Group of the Institute (GPMI), composed of 10 teachers out of the total 40, was established. It was about creating new spaces for an educational organization that was able both to break the limit of the group-class and to create new didactic instruments. The resulting organization is marked by great investment in terms of human resources. Teachers, on their own initiative, transformed their professional competence to create new ones, thereby combining innovations with curricular didactics. The school became more flexible with the first experiences of autonomy, being able to meet the individual needs of the students. By the same token, it was possible to form bilingual classes to place side by side with the monolingual ones. Subsequently, the student-teacher relation changed.

Every single change was approved unanimously with just one abstention and no unfavourable votes. The toughest obstacles to overcome concerned space management and the new timetable. All our teachers were immediately involved into a self-training or collective training activity. All our teachers and all our students were involved in new didactic methods, regardless of their marks but with great attention to disabled matters. Since the timetable had been concentrated, one of the main risks could have been a neglect of the fundamental subjects. We were particularly attentive to avoid that risk.

In the 80s the school "Lepido" was in trouble. It was considered a ghetto-school. The gap between different classes was too wide and year after year it worsened. Families preferred to enrol their children to another school close to Lepido, that was thought to be better from an educational point of view. The school managed to gain credibility following new paths, being able to solve its problems thanks to the consistency of the proposals issued by our teachers. If some changes had not occurred, weaker students would have been more and more discriminated.

Within this framework new technologies were very important. Assistant teachers were the first to introduce new technologies considering them an important instrument to help people with learning retardation. Then four more teachers started to attend training courses at the CRIN (Centre for Computer Research) in Reggio Emilia, and visited other schools in order to take into account their experiences. The school principal, too, promoted the use of computers and attended computer-science courses intended for school managers. But the project "Multilab" gave the decisive push to the introduction of ICT. Not only permitted it to buy new equipment, but it also allowed a proper training activity,

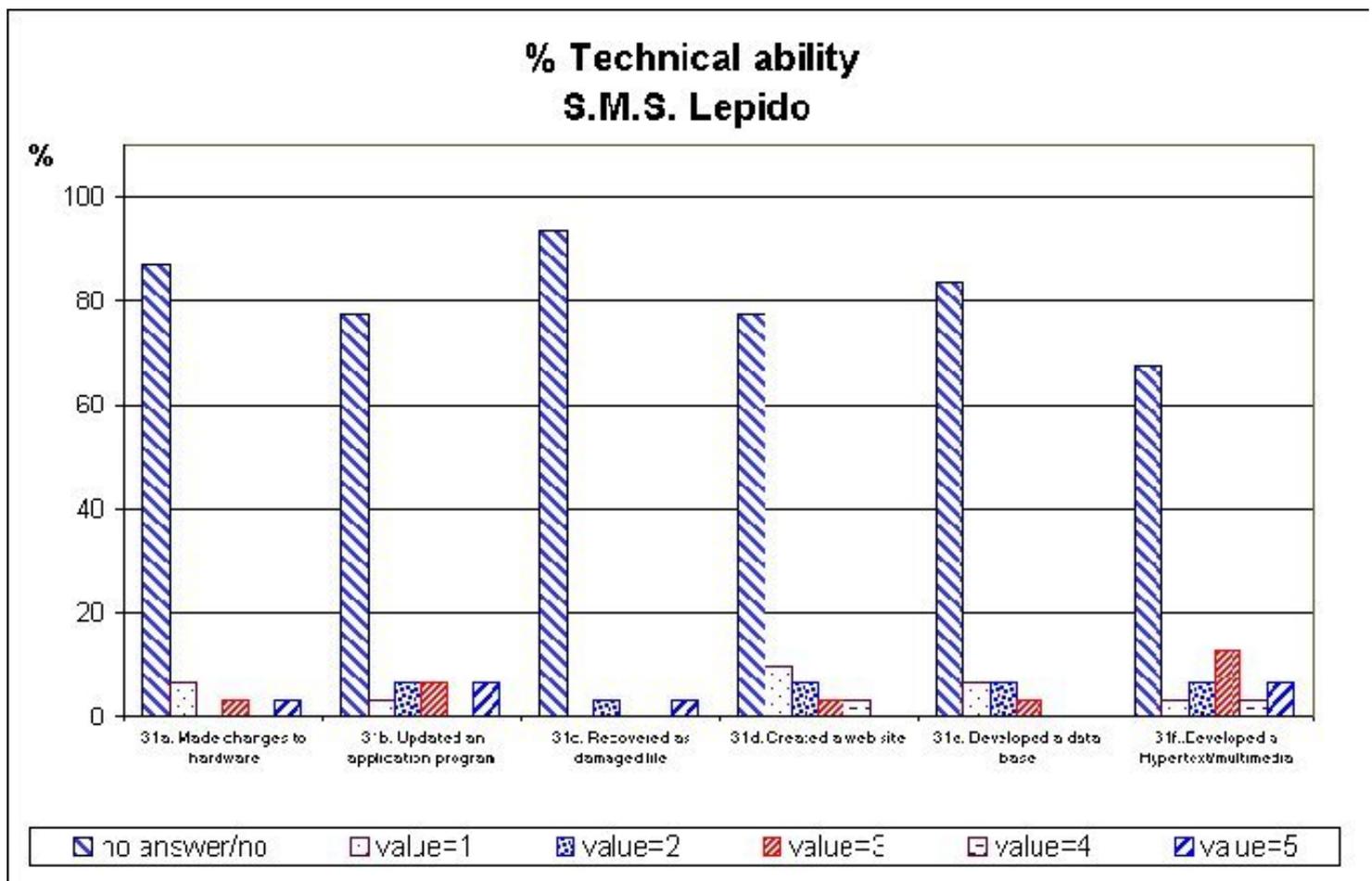
addressed in particular to less competent teachers. The course lasted three weeks and was held in Montecatini and Stresa, where teachers stayed. The first computer was bought in 1991. At first there were some difficulties in involving teachers, in particular mathematics and science teachers.

3. The present

Today the school has 2 multimedia laboratories with 29 computers in all. One of the two laboratories is connected to the Internet through an ISDN line. To tell the truth, currently we have some problems with these laboratories since they need to be updated. In fact, hard disks of the computers we have are now full, and have not enough memory to install new software. The headmaster is worried by the situation since new funds from the Ministry of Education are not envisaged in the short run. According to some statements, the computers the two laboratories are equipped with can still work at the most for two years, but it is a broad prediction. On the other hand, there are no problems for technical assistance that is made by a technical, didactic team, and in particular by the teacher who is a specialist in ICT. The school never resorted to external technical assistance, not even for hardware repairing.

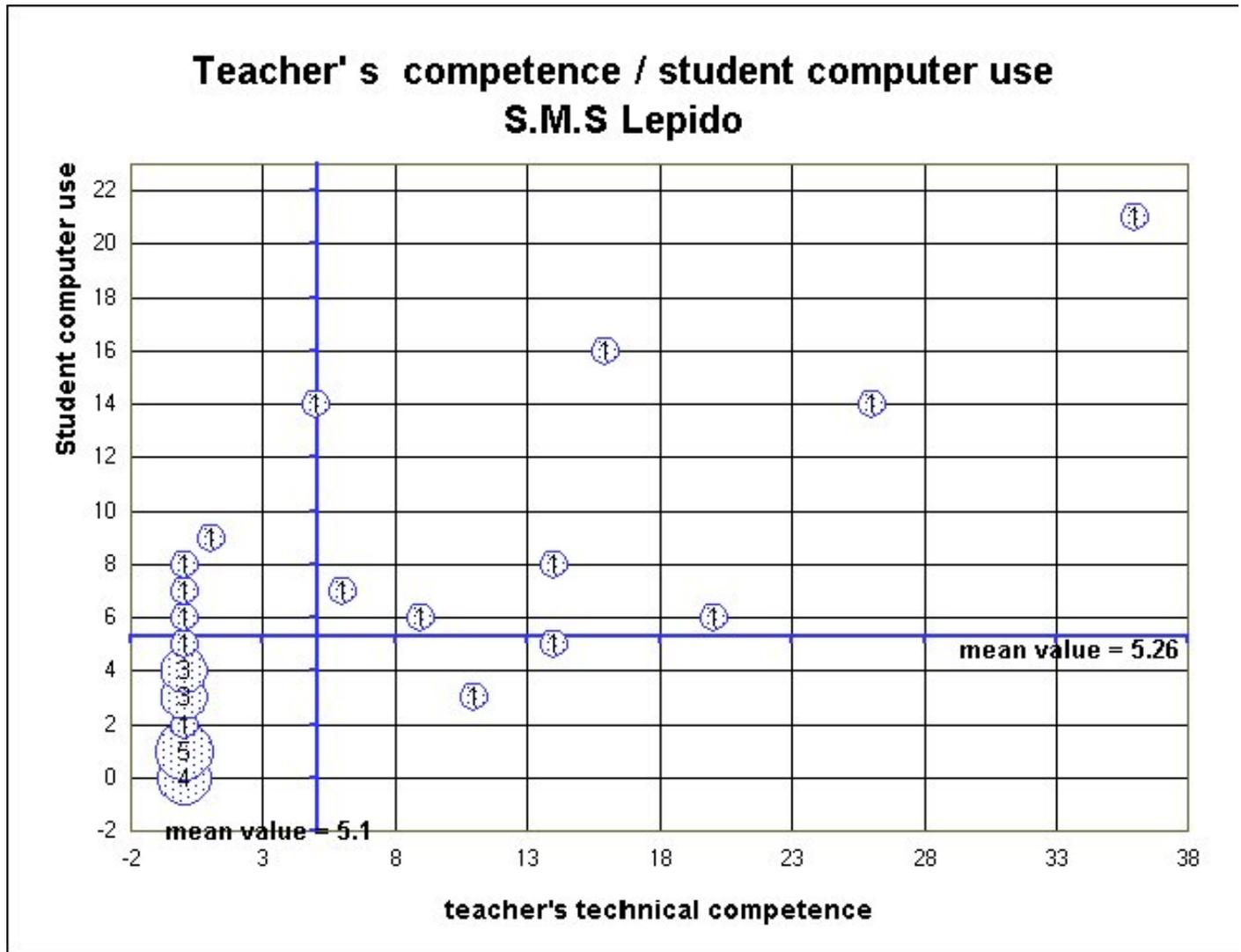
A technical, didactic team guarantees that all our teachers work effectively with ICT. The team that formed following the financial help received by the OFI (Functional Staff of the Institute), is made up of a tutor-teacher nominated by the teaching staff, a teacher in charge for technical problems and four more teachers with various skills. In particular, it guarantees laboratories proper functioning, didactic support to teachers, software updating, Institute web pages maintenance and e-mail checking. What is more, it proposes and organizes training activities for teachers, linked to their activities within the Institute, preparing the relevant documents.

In the school there is only one group of 9 teachers (out of 31), involved in activities requiring more than the simple use of software (Figure 1):



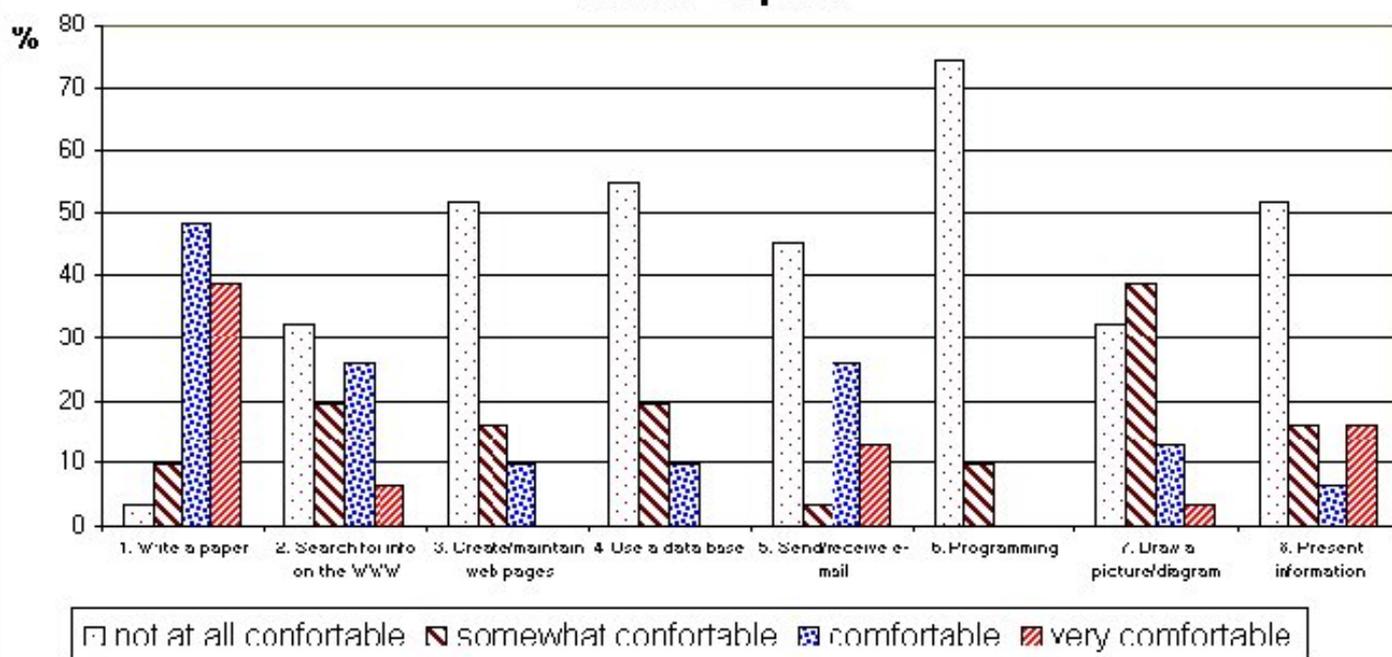
It is the better-skilled group from a technological point of view, and it is a point of reference for all those teachers who are just starting to follow the same path. Their skills are mainly focused on software updating and hypertexts or multimedia developing: for example, they created the school website. These teachers often propose activities to their students, in particular concerning the creation of hypertexts. One of these, called "Storia di una gabbianella" - "The story of a little gull" can be seen online: it is a work that engaged our classes for a few months.

The table shows on the abscissa the sum of the scores of the answers concerning teachers technical skills (questions 31a to 31f of the questionnaire), and on the ordinate the sum of the scores of the questions 8 to 19, about how often students use computers for their activities (Figure 2):



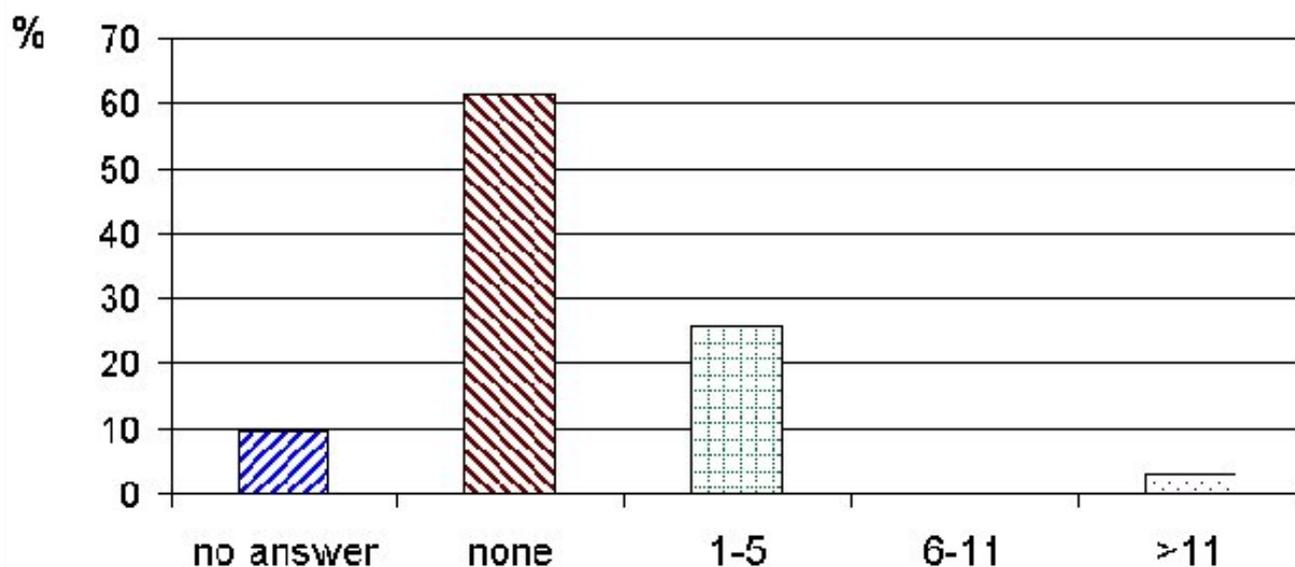
Generally teachers are pretty good at using computers, particularly with word processing (90% is able to use a word processing software) and e-mail sending/receiving; in fact 40% of our teachers has a fair or good ability in this activity (Figure 3):

Teacher familiarity with using... S.M.S. Lepido



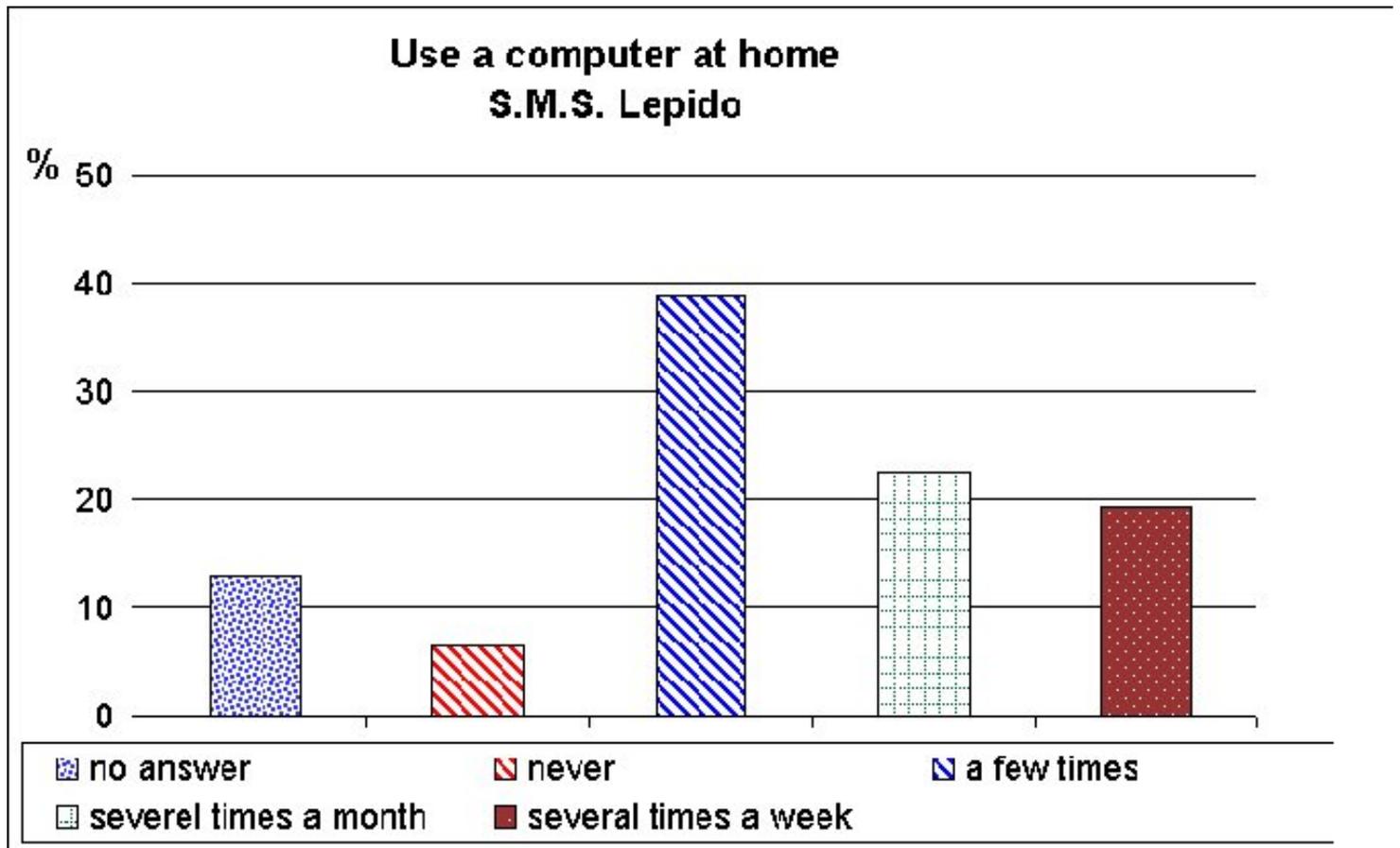
Even if only 30% actually send or receive at least one message per day (Figure 4):

How many e-mail...? S.M.S. Lepido

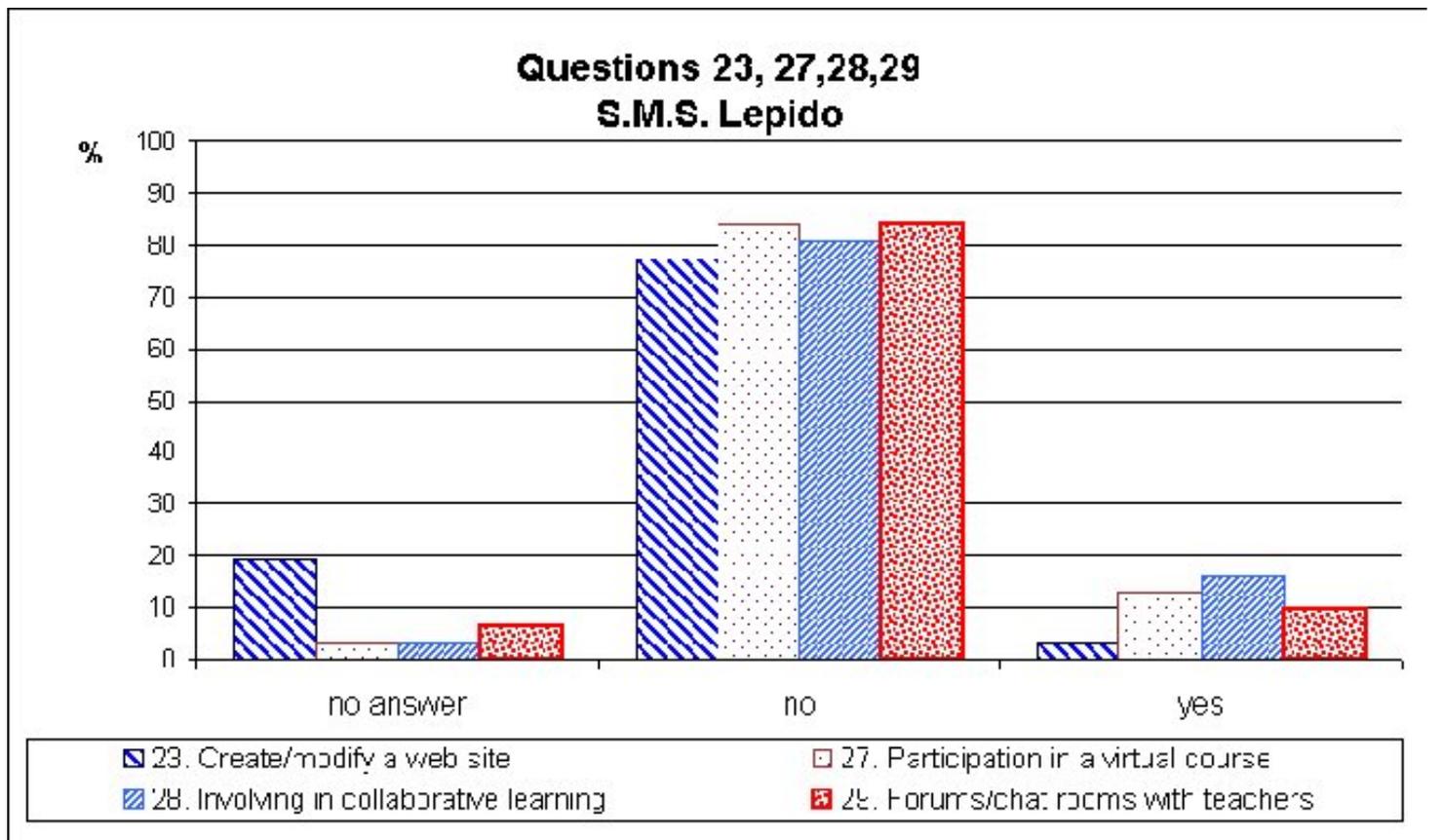


Anyway, unlike the previous datum, these skills are not connected to the activities teachers make with classes. In fact, some teachers use computers mainly to prepare their lessons or to attend refresher courses online (a very low percentage

of teachers, Figure 5):

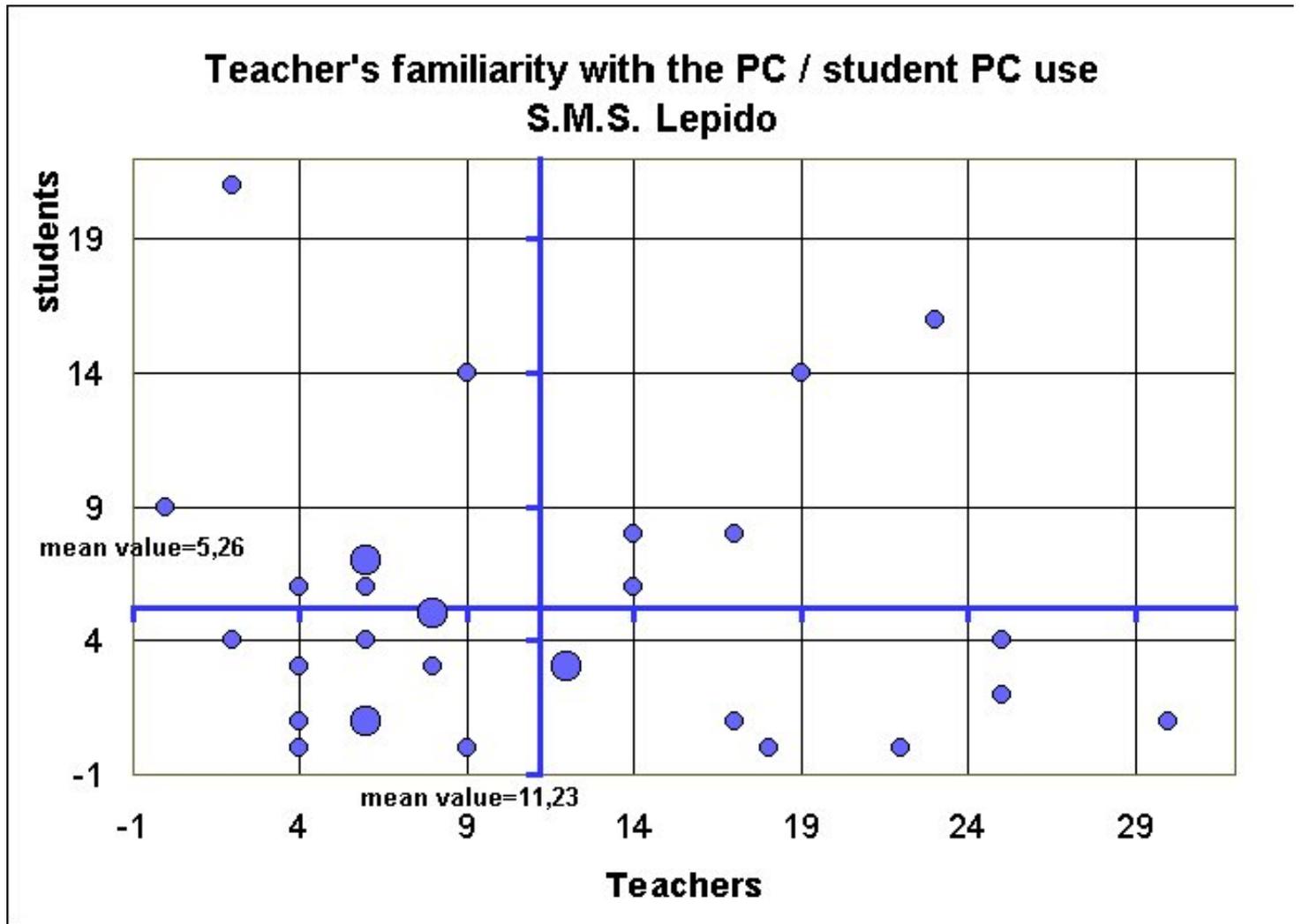


or, anyway, to work together with other teachers through forums or chat rooms (Figure 6):

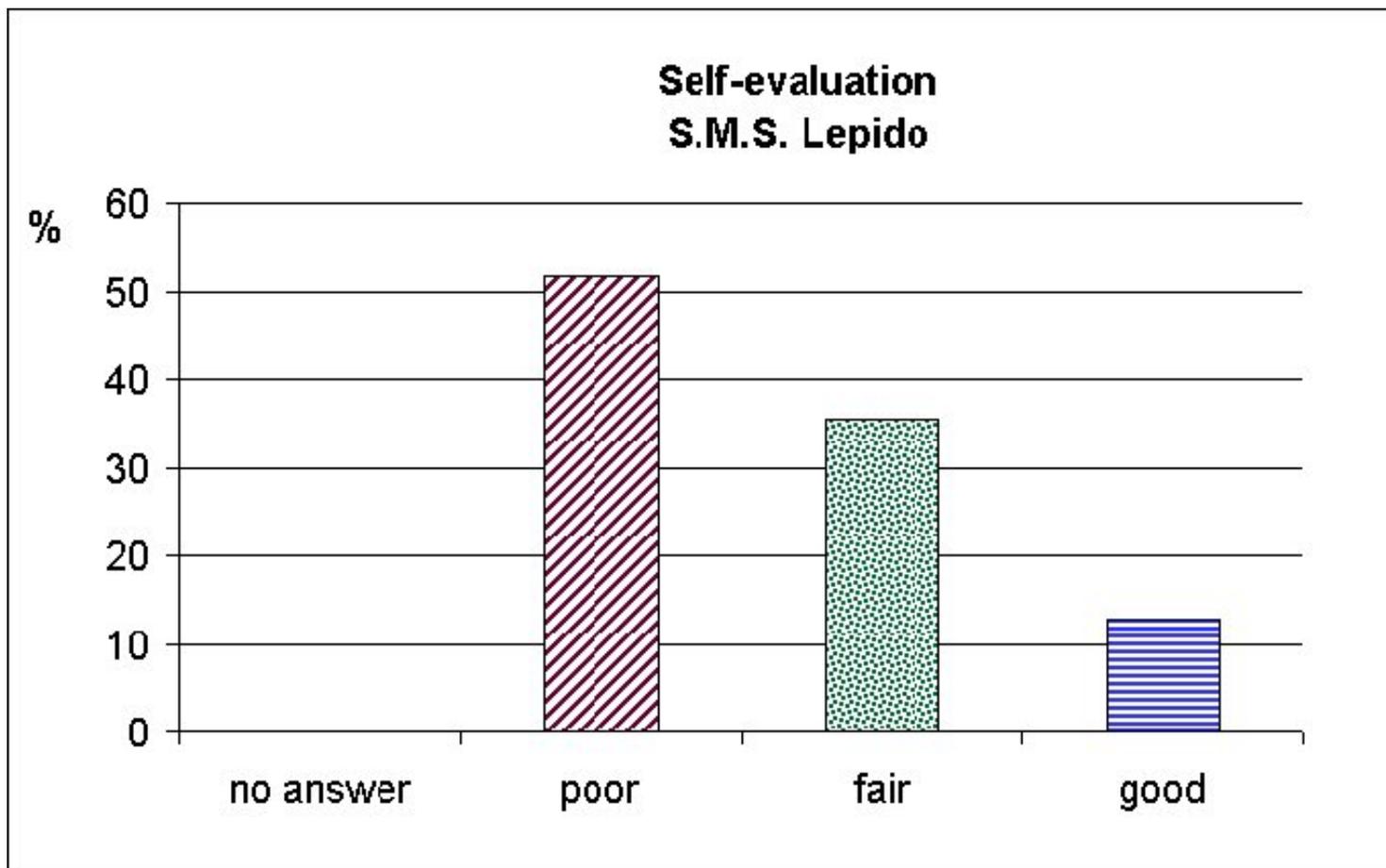


The table Figure 7 shows the ratio between teachers skill in using computers (on the abscissa there is the sum of the answers scores, from 1 to 8 of the questionnaire) and the sum of 8-19 questions scores (on the ordinate) about how often

students use computers:



More than half of our school teachers deems to have a fair or good expertise in the use of computers (Figure 8):



Students spend a lot of their time in school laboratories, suffice it to think that during the 1999/2000 school year our classes spent 587 hours (of 50 minutes) in all, into laboratories; in particular 130 hours the first classes, 377 hours the second ones, 80 hours the third ones. This constant taking part to computer activities into laboratories is only a part both of the general educational change and of a research of new educational paths.

ICT are closely linked to didactic planning and there are a lot of main applications:

a) for didactic co-operation teachers often use multimedia instruments, also during lessons where students just listen to their teachers in order to highlight notions and their connections:

b) during readings CD-ROMs are used, for example in English laboratories, students use them to go deeper into particular aspects of the subject, following free or guided paths;

c) for individual or co-operative documents editing, for example the school magazine, short stories, poems, reports, reviews.

d) for hypertexts designing and creating. An important example is the hypertext concerning a Luis Sépulveda book (“Storia di una gabbianella e del gatto che le insegnò a volare” – “The story of a little gull and of the cat who taught her to fly”) published on the school site:

<http://progetti.webscuola.tin.it/multilab/rege03/gabbianella/prima.htm>;

e) for documents gathering activity in order to keep what our classes created and to retrieve documents to integrate them and to make comparisons. Anyway, at this purpose some teachers state that they are not very skilled in using databases;

f) for guided Internet surfing, particularly to use some sites having a specific didactic content;

g) for e-mail use in order to compare experiences and to interact online with other schools.

Technologies are considered extremely interdependent to educational paths and their learning patterns. The main paths of change that allowed our school to make an important qualitative leap from an educational and didactic point of view can be summed up in:

a) a greater opening of the school to the outside, with a reduction in the exclusive teacher-student relation;

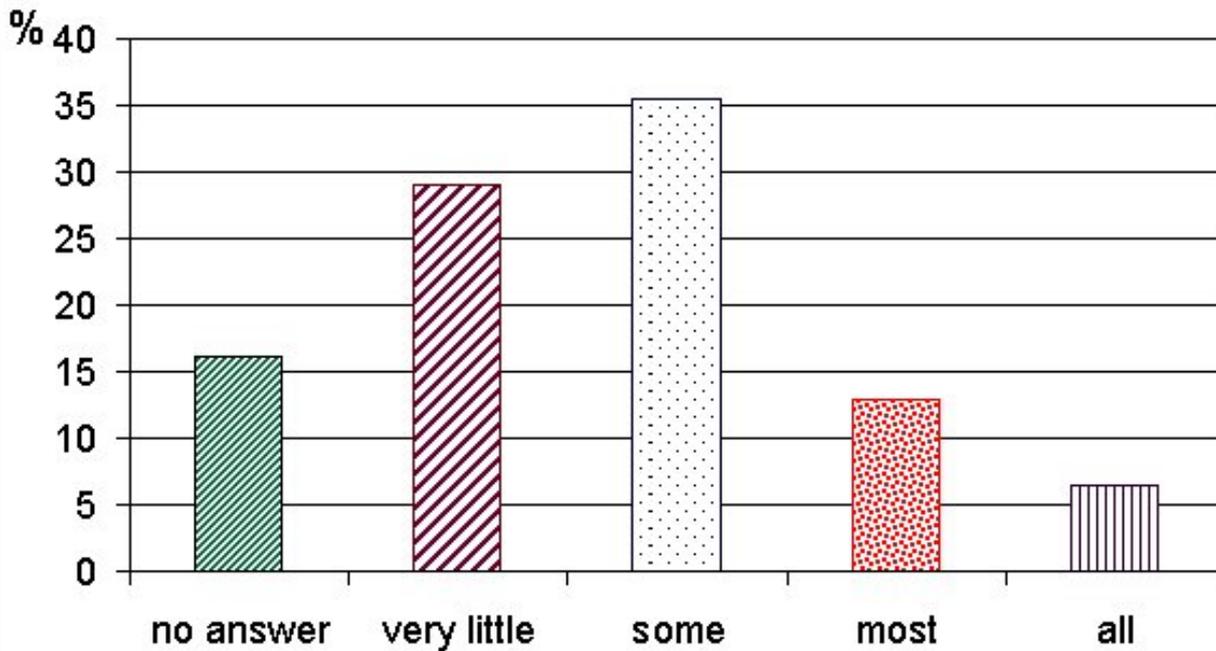
- b) the space we gave to new interactive and cooperative paths;
- c) personalization of the learning paths thereby making interventions through a flexible education;
- d) a much wider combination of theoretical and practical knowledge than the curricular model based on homogeneity and consequentiality;
- e) the prominence and enhancement given to activities of pre-technological nature (that is existing before the coming of technologies): the art of storytelling, the pleasure of reading, reasoning. Not only are not these activities replaced with those including the use of computers, but on the contrary, they are enhanced. A student with severe dyslexia and dysgraphia but endowed with quite good computer skills found his path towards the traditional reading and writing activities thanks to these skills;
- f) the change in the teacher professionalism. In fact, the teacher is not only the person dispensing knowledge but also a coordinator, an entertainer, a person suggesting paths to be followed and helping students.

The interviewed students state to appreciate particularly laboratory activities that take place at school; in particular they say they like laboratories L4 and L5. They point out the fact that printers are a bit slow. Generally speaking they don't have an e-mail at school, but they surf the net above all to discuss with peers of other schools through chat rooms, to search news about travels, hotels and itineraries, in order to create a web page on tourism, within the project "Itinerando" – "Travelling". Most of the students state that computer is an important learning help; they have various ideas on what could be done to improve the use of computers and the Internet at school: from technical improvements (changing some of the oldest computers, updating the operating system, buying new software) to educational ones such as the desire to change more often web pages and to have more freedom in word processing activities. At home, about 50% of them has a computer used both for games and for word processing activities relative to homework given by teachers.

What is more parents state that both the new generation and the new educational choices stimulate their children. As for the problems about introducing ICT, interviewed teachers say to be generally stimulated to use them even if some of them state not to use ICT, but to appreciate the role they play in renewal. Anyway, all the teachers critically weigh the risks entailed by adopting ICT. They consider their emphasizing as negative because they could be used in an improper way (for example engendering a passive attitude in students). On the other hand they stress the importance of technologies to acquire transversal skills, most of all if we consider the knowledge net organization and the desire to acquire that knowledge. Laboratory activities are not separate subjects (it does not exist a specific subject concerning ICT) and computers become a useful instrument to get to a specific educational objective and to enhance transversal skills.

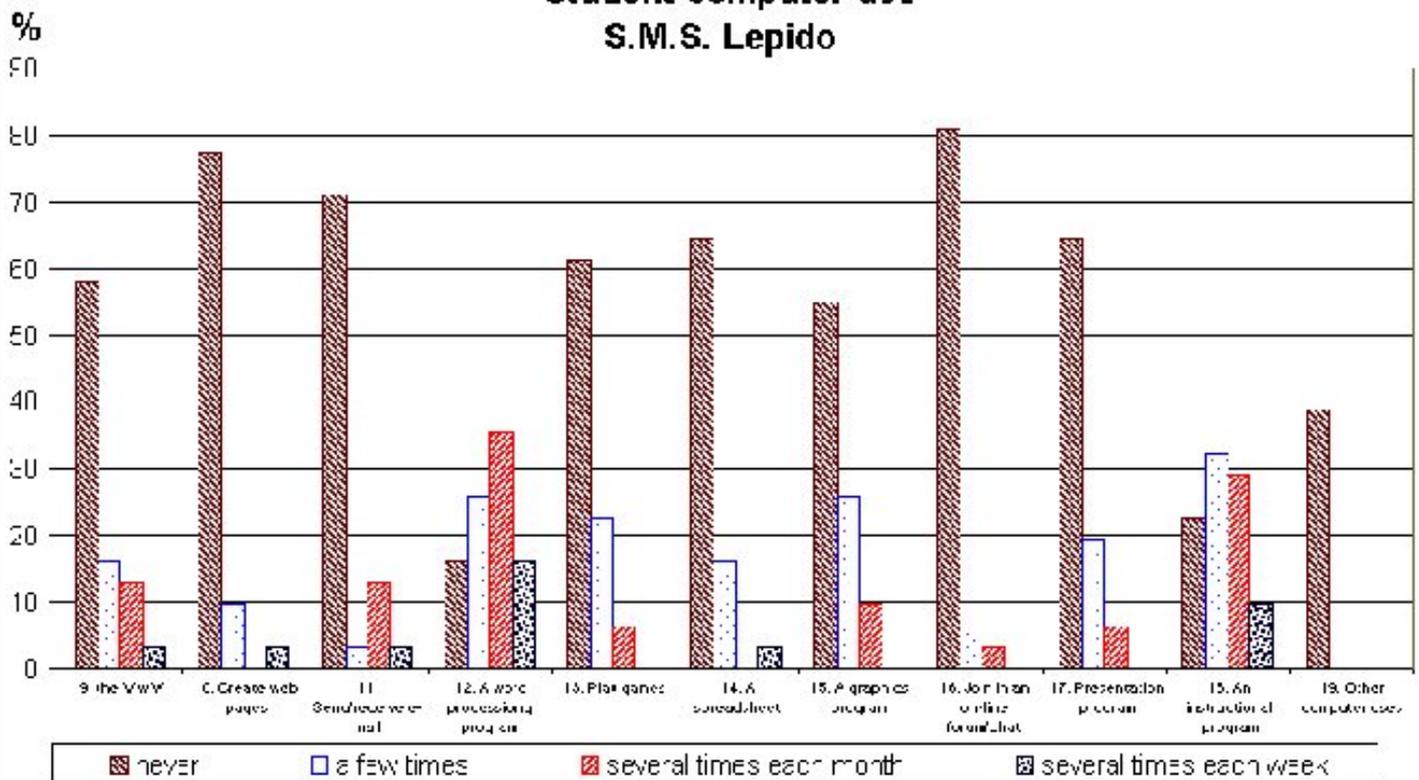
From this point of view, more than 50% of interviewed people, that is 80% of the teaching staff, combines "at least partially" computers use with didactic planning (figure 9):

Relation between computer use and curriculum S.M.S. Lepido

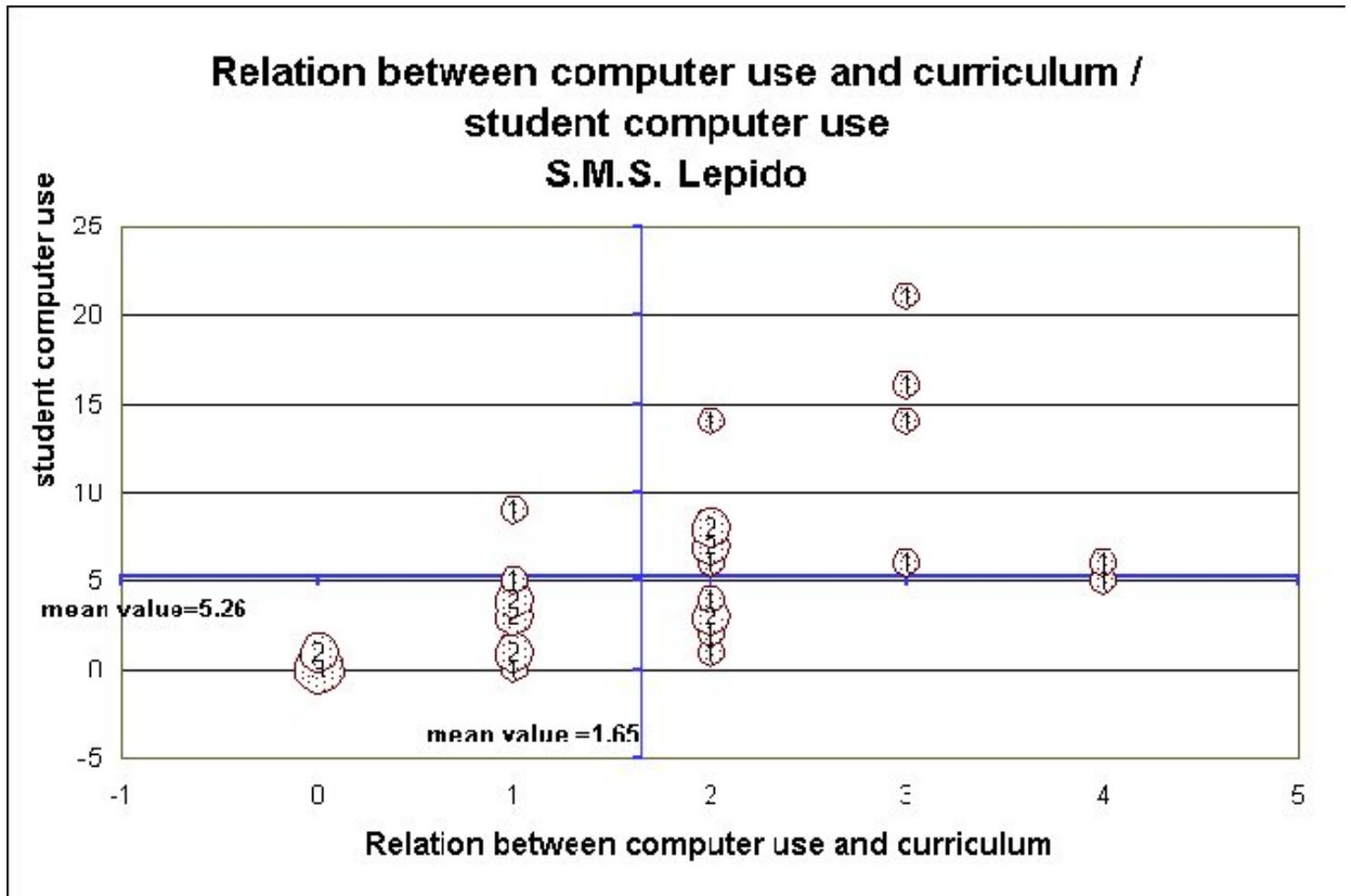


Anyway, that doesn't mean that this group of teachers uses laboratories all through the school year. In fact, they are mainly used when lessons require the use of technologies to a greater extent. About 30% of our teachers uses laboratories many times per week or per month, all through the school year. In this case they mainly use some specific software such as word processing software or didactic software, particularly English learning CD-ROMs (Figure 10):

Student computer use S.M.S. Lepido

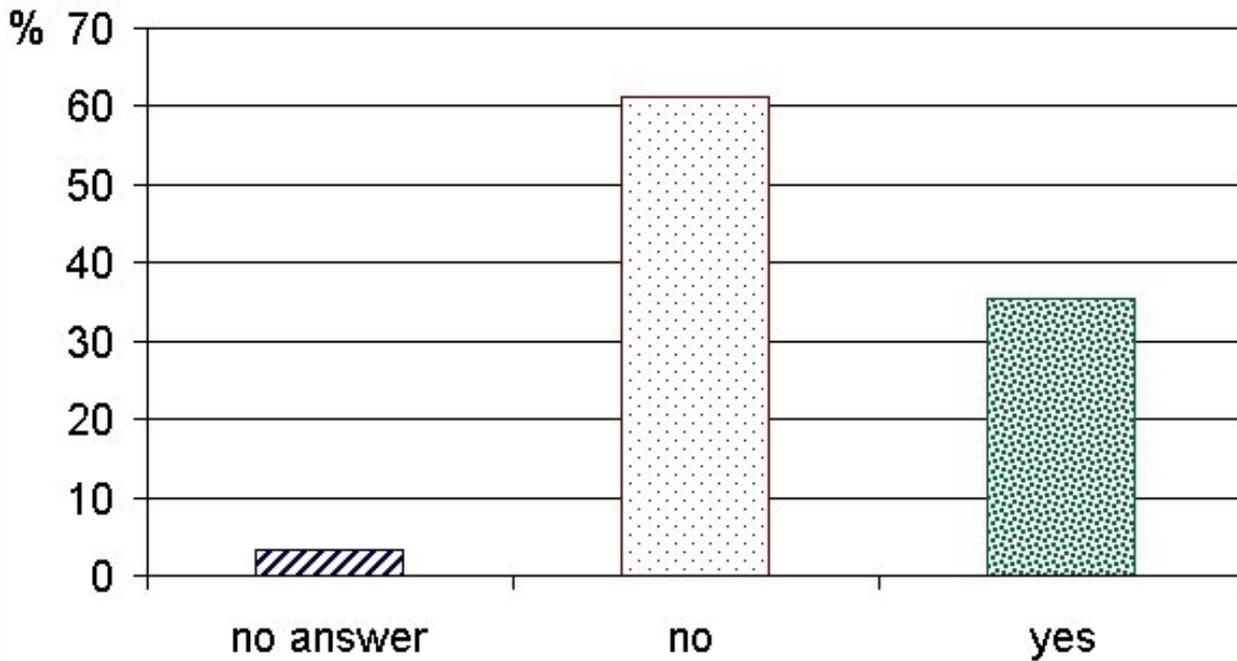


Other teachers use as often this kind of software, even if they combine their use with their teaching planning only indirectly. So they use computers just as one of the many useful instruments to get to the envisaged objectives, not considering them like the means to represent a learning path in an explicit and fixed way. The table shows on the abscissa how much computer use is combined with didactic planning (question 24 of the questionnaire), and on the ordinate the sum of the scores concerning 8-19 questions (Figure 11):



Classes statements during laboratory activities confirm what we thought about students stimulated and engaged into various activities. Teachers are present during the lessons and walk among desks and computers which are placed in rows in a laboratory and in a circle in the other. Students work in pairs (the ratio between students and computers is two to one), generally on the basis of a cooperative work suggested by the teacher. If that work is the following part of an activity they started previously, they are able to work on their own. After they are given instructions to start their work, students are guided into their activity by their teachers, through a feedback based on questions and answers. What is more, teachers stimulate their students to make remarks and critical analysis. In order to avoid confusion caused by continuous questions usually made by the students to their teacher, some classes have been equipped with a particular communication system based on paper flags (green = no problem; yellow = some difficulties; red = the computer doesn't work). Monitored activities in our two laboratories concerned in the first case e-mail use; students were writing a letter to their peers in another school to inform them about guidance activities made and about the way they were getting ready to go to the senior secondary school. In the second case, students were organizing data collected during their visit to a dairy the previous week, by using the function "table" of the word-processor. As to these activities, we need to say that about one third of interviewed teachers considers the work students make on computers, in order to give them a mark (Figure 12):

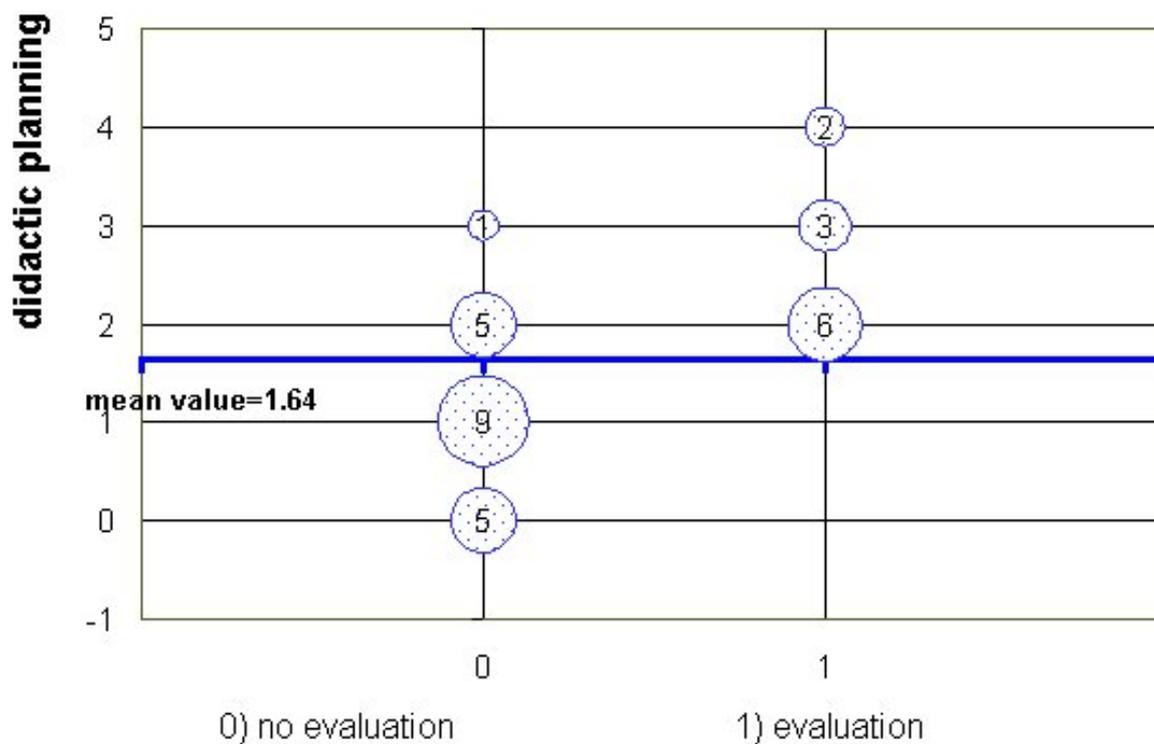
Student computer use evaluation for grading S.M.S. Lepido



It is a high percentage if we consider that in school like ours, informatics is not a separate teaching subject and computers are mainly used to acquire educational expertise.

We are talking about the same number of teachers using many times per month or per week some software, as shown by the chart, where on the abscissa you can see how computer use influences the marks given to the student (question 21 of the questionnaire), and on the ordinate how computer use is part of didactic planning (question 24). Figure 13:

mark / didactic planning S.M.S Lepido



In general, ICT large use from students provides a further motivation in knowledge acquiring thereby influencing didactic "strictness" positively. On the other hand, this strictness is fair: very-skilled students as well as less-skilled students, students with a different social status and economic condition have the same opportunities to use computers. Only handicapped students use computers for longer periods, with remarkable benefit.

4. Basic hypotheses

4.1 As you can see, within the context we examined, technology is a tremendous catalyst of innovations. It is not just one of the change factors, but definitely something more. Technological innovation brought general educational and didactic improvements. We can concretely affirm that ICT introduction allowed to conceive new didactics based on the increase in the formative offer. From that increase resulted a wide range of paths, doorways to knowledge, knowledge representations, ways to communicate (both within and outside the school).

In this case technology doesn't differ from traditional innovations and its path is neither different nor parallel. Even if technology is powerful, it can be considered one of the instruments that allowed teaching renewal. So, technology is not for its own sake. In the context we examined, we found great integration between ICT and what we can consider education "traditional" objectives. In fact, students are stimulated to spend their time working on paper books and exercise books. So, leafing through a book as well as using paper and pen do not become less important but, on the contrary, more important. Just like in the already mentioned attempt to help a dyslexic student. In that case computer does not replace traditional instruments, it works together with them as a catalyst thereby heavily contributing to enlarge the formative offer which is revitalized in all its parts.

4.2 According to the Rogers model, technology spreading actually followed a gradual pattern. After remedial teachers, which were the first to ask for innovation, other teachers started to use technologies after they attended training courses. In fact, it is important that among the most fervent supporters of laboratory didactics there were humanities teachers, with significant seniority. Experience together with the high number of lessons humanities teachers have in the classes, allowed them to combine instruments with educational objectives and curricular activities.

4.3 Technology effectiveness depends on teachers ability to integrate them with teaching and learning processes. Educational values exist if teachers are competent, that is why the school proposes to the students to use those kind of

software which guarantee the possibility to get such values. In order to do that, the new software is carefully examined and tested, before being installed into laboratories. Technology is an instrument allowing to get the most traditional learning objectives by following different paths. In the past, different processes were combined in a single strict and sequential path, with risks for students having skills that didn't match school proposals. Both enlargement and variety of doorways to knowledge give to all the students the possibility to study and to express their potential at the most. Within this framework the teacher has an unprecedented importance. The new teacher which is emerging in this school is in fact multifaceted: he is no more a simple knowledge giver, the new teacher must be able to change his role according to different situations. In the laboratory activities we monitored, he behaved differently: at the beginning he communicated information concerning different tasks that had to be accomplished, but later on he behaved as a coordinator when working group activity needed to be guided; as a moderator when students needed to be helped to reach an agreement among different parts; as an advisor when students in trouble needed to be helped. So, the presence of the teacher and his guiding role is important in order to use technologies fruitfully. But all that rises the issue of teaching staff stability. In the junior secondary school "Lepido" in Reggio Emilia there is a group of teachers with great working experience, who decided to take charge of ICT introduction, combining them with didactic and educational values, in a positive way.

4.4 All the students of the school can use laboratories and computers apart from their social status and their skills. This contributed to reduce gaps among students with different marks. Technology seems to be able to give opportunities to different kinds of brains, not only to traditional minds. Just for these reasons, an ever-increasing number of students was able to get to the "minimum" objectives envisaged in the didactic planning. The variety of doorways to knowledge allowed everybody to learn also in a personal, more active and absorbing way, and even following "divergent thought" paths. Students grew in awareness of their own abilities so that they feel learning paths closer to them and they generally look at the school, as a centre promoting activities. So, it is to stress the fact that our teachers organized evening informatics courses for parents, in order to open up to the outside and to interact with all the parts involved in the hard task of young people forming.

4.5 The high number of hours the classes spent in computer and multimedia laboratories did not reduce the "educational standard", from the point of view of knowledge and expertise, but on the contrary, it increased that standard. Classes worked in laboratories 587 hours in all, of 50 minutes, plus 183 hours in laboratories L4 and L5. 411 hours concerned only assistant activities. Students progress levels in first and second classes show higher learning quality than in the past. In the first classes 5% of the students has an insufficient progress in Italian and mathematics, while the percentage swells to 10% in the second classes. This increase in students progress standards can be explained in two ways: a) an increase in the motivation following an active involvement in knowledge acquiring processes; b) a detection of learning paths that, because of their variety, satisfy singular natural bents, different sensitivities, passions and subjectivity.

5. Projections

If we think to the future, the new path our school decided to follow and educational projects started, need funds. In time, without funds all innovations risk to disappear. It seems that the renewal needs medium- and long-term projects in order to guarantee a continuity to activities. In Reggio Emilia the problem is causing great concern, as well as, we think, in other Italian schools. According to what the headmaster, Mr. Curti, said, our school needs economic, instrumental and human resources. Funds coming from the Multilab project are just a starting point. The most urgent needs are: buying new computers, the connection to the local network of the second laboratory and the rearrangement of the spaces. When teachers were asked what if the school had not innovations and the following improvements, some of them answered that "before innovations the gap between classes was too wide and year after year the situation worsened". "In the 80s the school was in trouble, it was considered a ghetto-school". The risks of a return to the past were thought to be over, on the contrary, they loom. Educational and didactic planning is by now a firm reality, we know its effectiveness. What is worrying is that technology support can disappear following the obsolescence of available equipment. By now, the school in all its parts, teaching staff and non-teaching staff, has unanimously accepted and recognized the importance of technologies. Even the auxiliary staff (A.T.A.) is worried by every little problem, such as earphones breaking. All the teachers can use ICT and their interest in using them fully accounts for the time they devoted to training courses. Considering costs and benefits following the introduction of ICT, we can say that compared to costs, educational-didactic benefits are definitely remarkable. But how to transfer on a large scale effective experiences just like those that took place in this school? And most of all: how can better experiences become a model for other schools? This is a problem concerning recognition and appreciation of the most effective experiences and their transferability on a larger scale.

APPENDIX A - "Emilio Lepido" State Secondary School

Research team: The survey at "Marco Emilio Lepido" Comprehensive School, located in Via Premuda 34 in Reggio Emilia, was carried out by Prof Agostino Roncallo on 14th, 15th and 16th December 2000.

Survey length: 3 days

Interviews number and length. The interviews involved: headmaster, 6 teachers (among whom a technician responsible for ICT), 4 parents, a member of the auxiliary staff and 5 groups of students for a total number of 20 students on the whole. The interview to headmaster was scheduled in two sessions, at the beginning and at the end of the survey respectively. All the interviews were, on average, of 45 minutes except for interviews to students which were targeted for 30 minutes.

Methods: the selection of people to be interviewed was accurate. It was thought convenient to work so that 50% of the sample did NOT involve enthusiastic ICT users, in order to get a reliable view of the connection between technology use and school education objectives. Parents and students were selected randomly. All the interviews were recorded on tapes and played back subsequently. Interviewers tried to create a convenient atmosphere, thus avoiding to ask questions too stiffly and sharply. After collecting personal information, the interview covered two main areas: school didactic innovation and improvement and technology use. Finally, a closing question requested personal opinions about how to improve academic performance and ICT use.

Quantity and quality of collected data: besides the teachers questionnaires and the recordings, the "POF" (the school "Training Offer Plan"), the organization/scheduling activities program, the 2000/2001 school year report concerning school multimedia lab activities were also collected and analysed.

APPENDIX B - "Emilio Lepido" State Secondary School

Fig. 1

Comparison between ICT applications suggested to students in class (questions 9-19) and their correlation with curriculum (question 24). The answers concerning ICT integration in curriculum are given on abscissa. Values range from 0 = no answer, 1 = very little to 4 = completely. The sum of the scores given to answers 9-19 is on ordinate, that is 0 = never and 3 = many times per week. The bubbles size shows the frequency (the number inside the bubble) of the given value. The sum of these frequencies corresponds to the number of teachers who have answered the questionnaire:

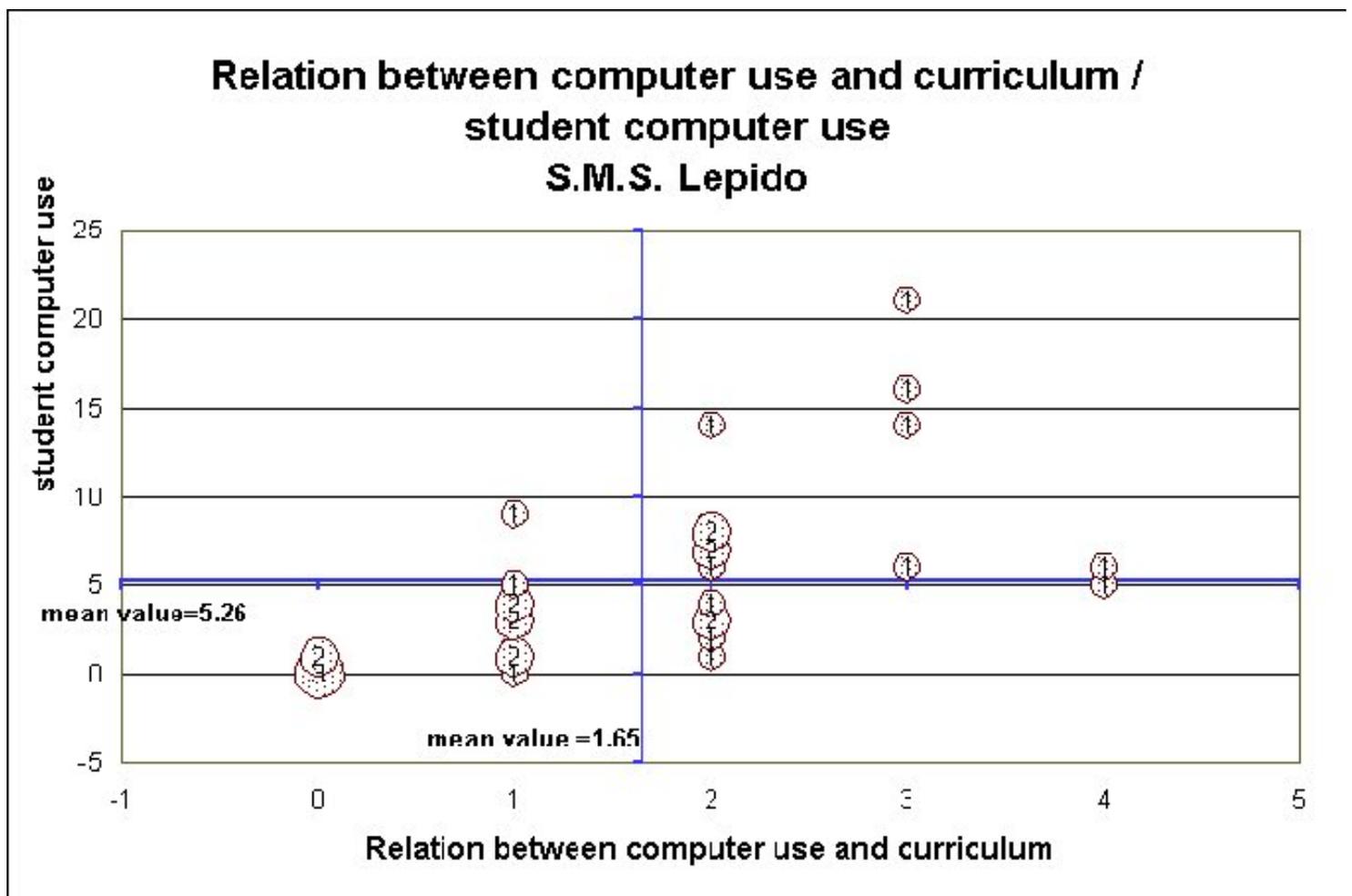


Fig. 2

Comparison between ICT applications suggested to students in class (questions 9-19) and the computer work assessment in giving marks (question 21). On abscissa, 0 means lack of evaluation and 1 means evaluation. The sum of scores concerning the uses of computer suggested to students is on ordinate; their values range from 0 = never or no answer to 3 = many times per week:

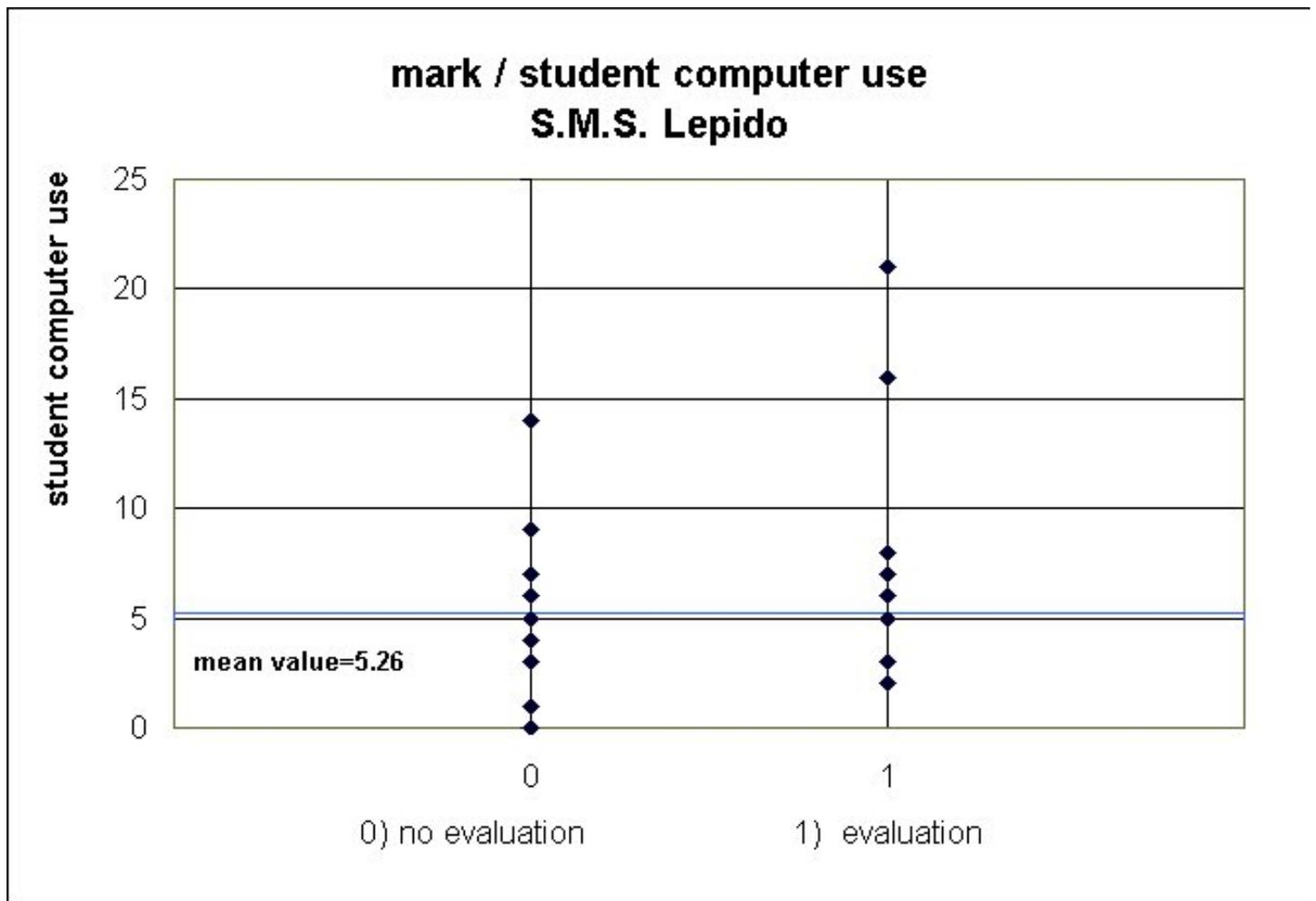


Fig. 3

Comparison between computer use assessment in the assignment of marks (question 21) and link between computer use and didactic planning (question 24). The presence or absence of assessment are shown on abscissa (yes/no = 1/0), while on ordinate the values range from 0 = no answer, 1 = very little, up to 4 = completely. The bubble size shows the frequency of the given value. The sum of the values given in the bubbles correspond to the number of the answers obtained:

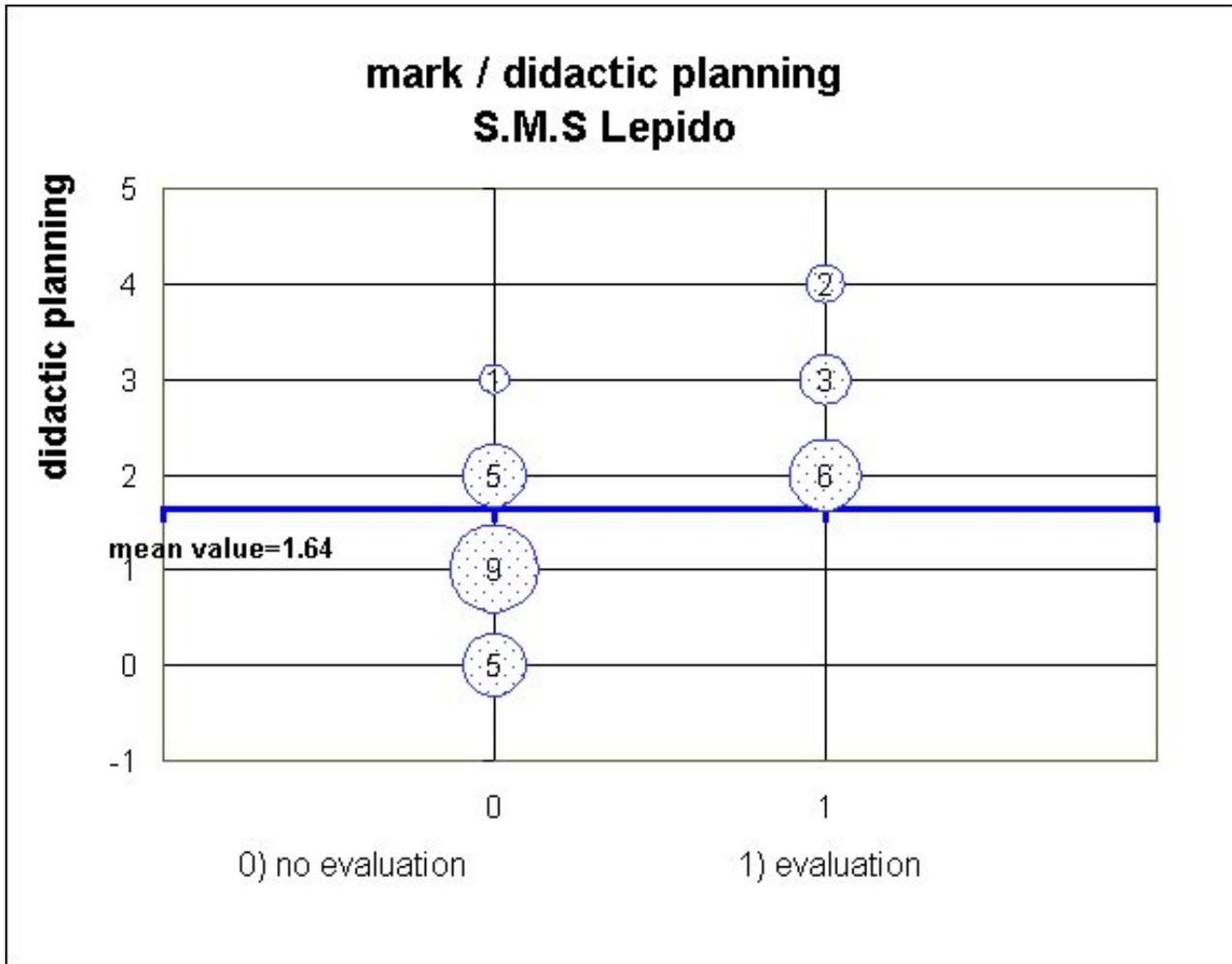


Fig. 4
Per cent distribution of the answers to question 21 about the importance of computer use at the moment of students assessment. (Was student computer use ever evaluated for grading? Yes – No):

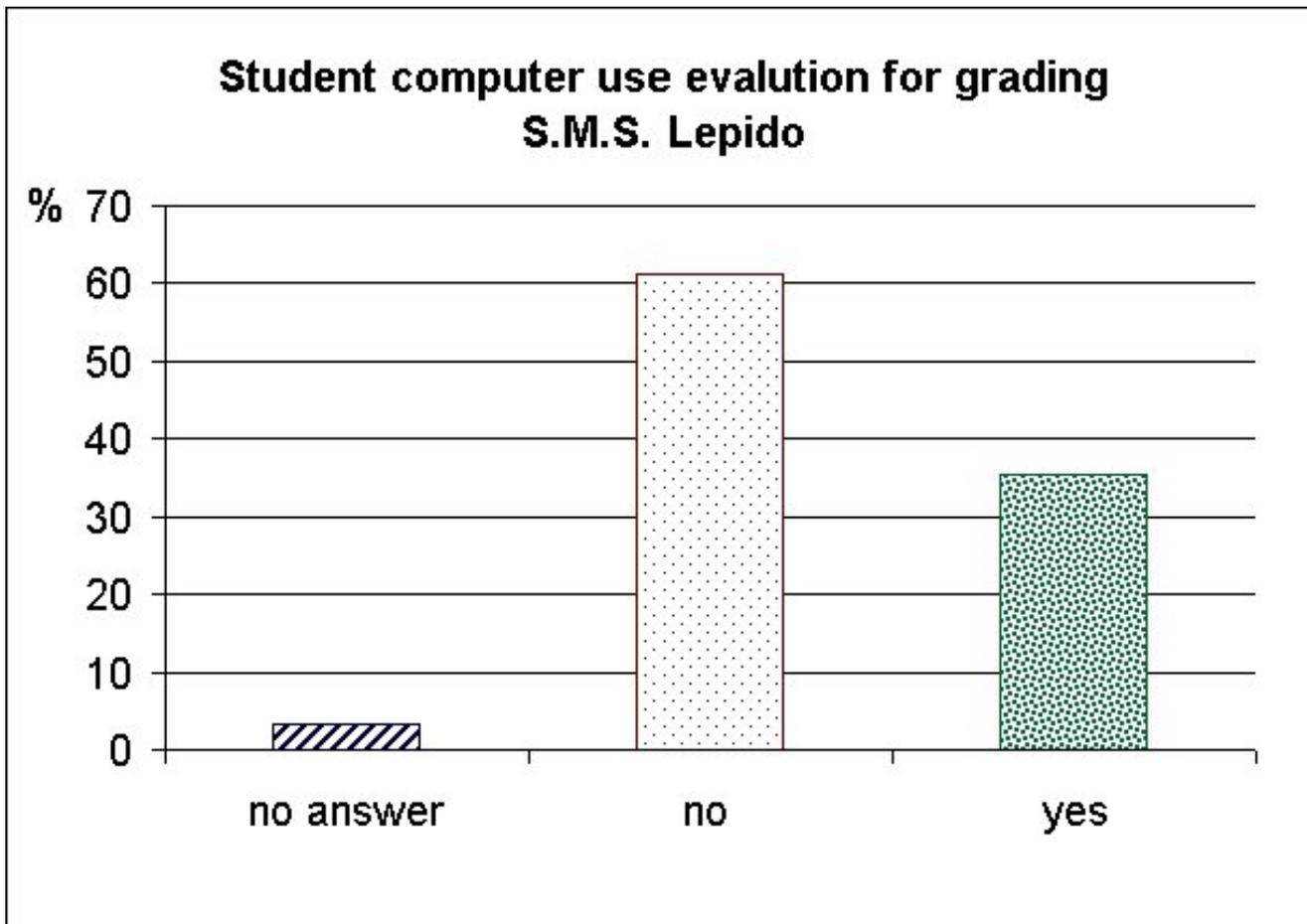


Fig. 5

Per cent distribution of the answers to question 24: at what extent computer use is directly related to the didactic planning (what portion of the computer use in your classes was directly related to the course content): all, most, some, very little:

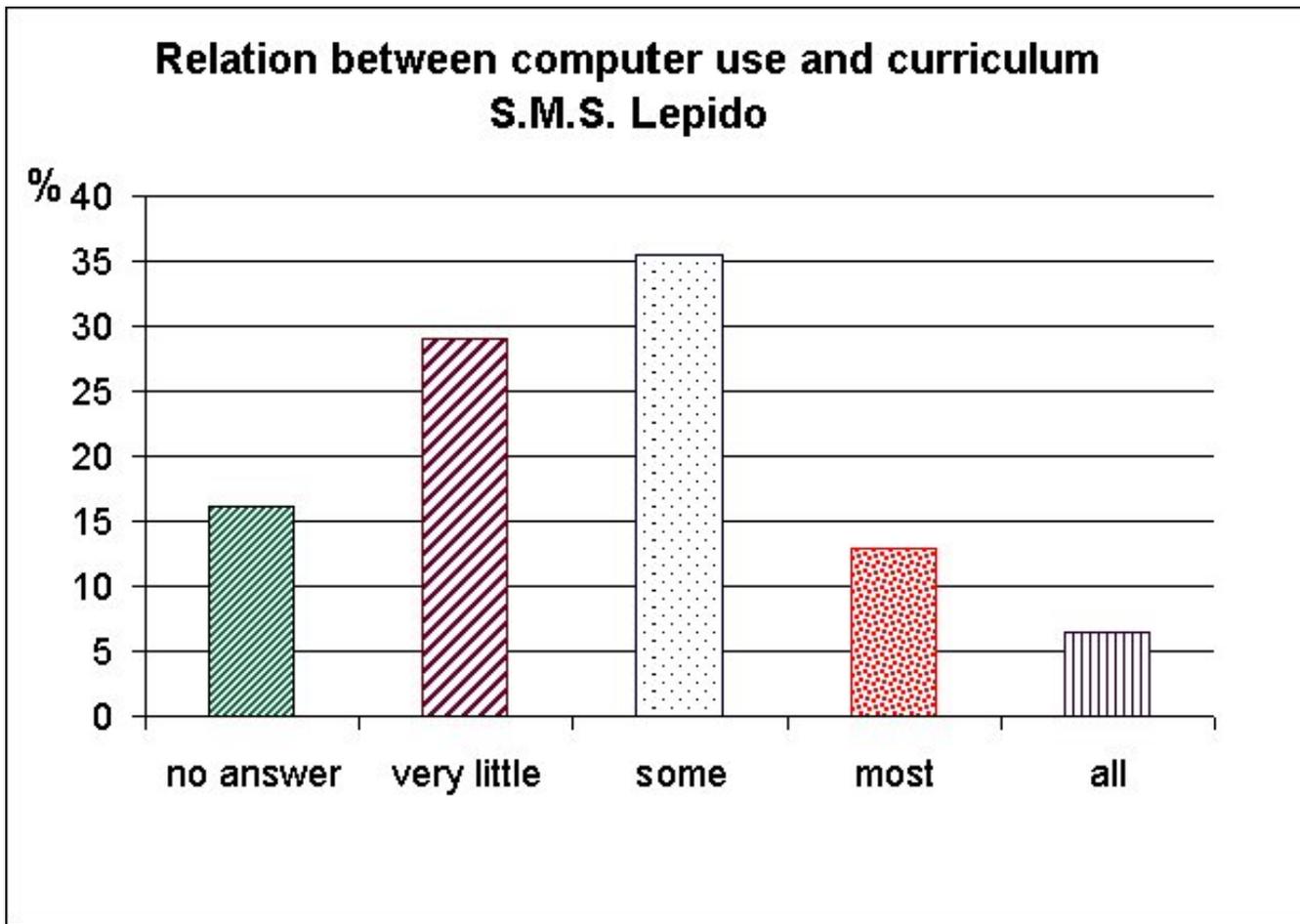


Fig. 6

Relation between the technical competence and experience of teachers in the computer use (question 31a – f) and its use by students in classes (question 9-19). The bubbles size shows the frequency of the value which is also indicated by the number inside each bubble. The sum of these numbers corresponds to the answers obtained. On ordinate, there is the sum of the points given to the answers 9-19. The score for each question ranges from 0 = never or no answers to 3 = more times per week. On abscissa there is the weighted sum of the answers concerning the teachers' competence. The "weight" is obtained by an analysis of frequency of the answers 31a – f (fig. 11):

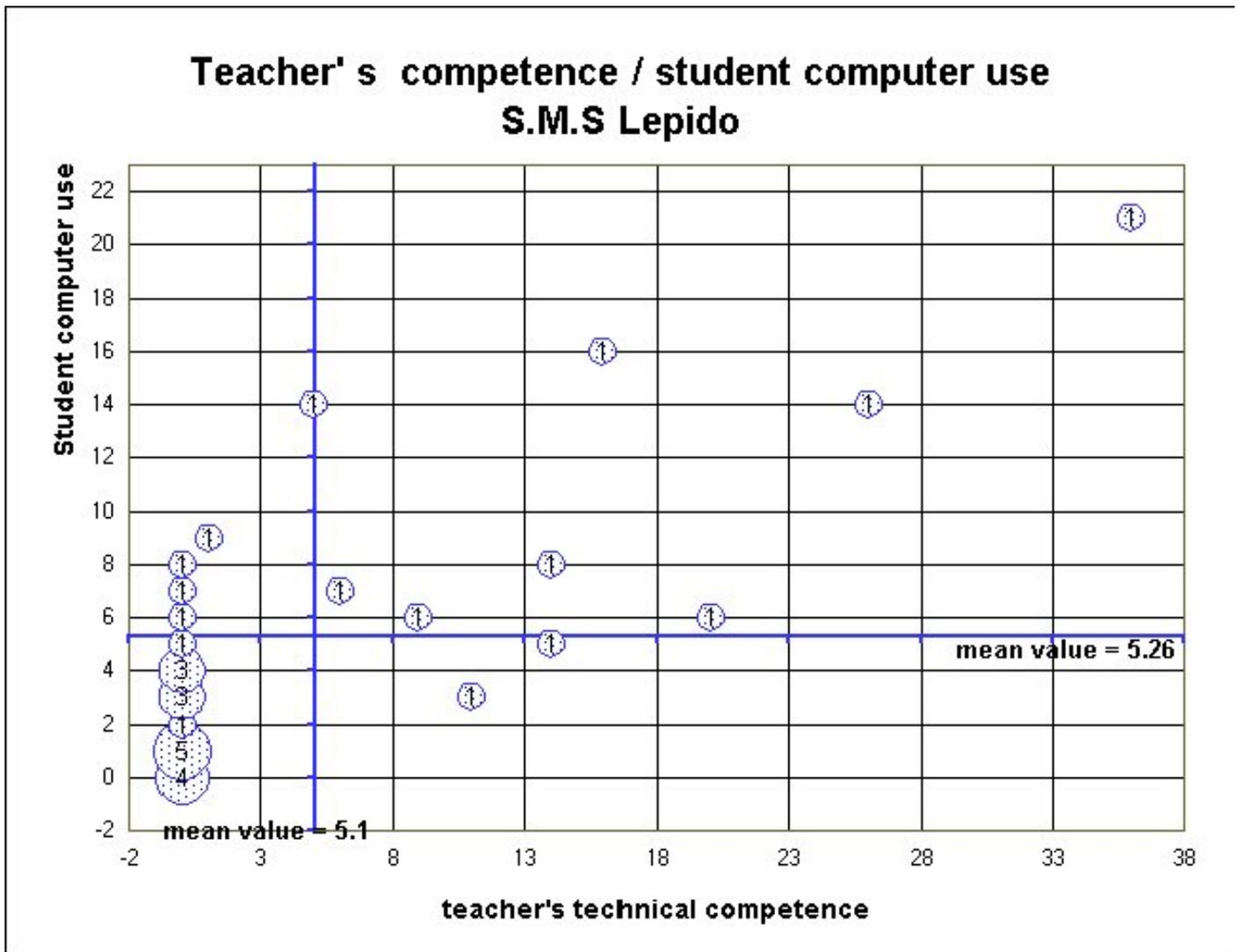


Fig. 7

Relation between the familiarity of teachers with the computer (questions 1-8) and their use by students in classes (questions 9-19).

The answers 1-8 were assigned a score from 0 to 3 for the possible values of answer (no familiarity, a little, enough, much). Furthermore, these scores have been weighted according to the statistic relevance pointed out by the answers to these questions (as shown in the histogram of fig. 13). The most frequent answers were assigned a double score. The bubble size indicates the datum frequency:

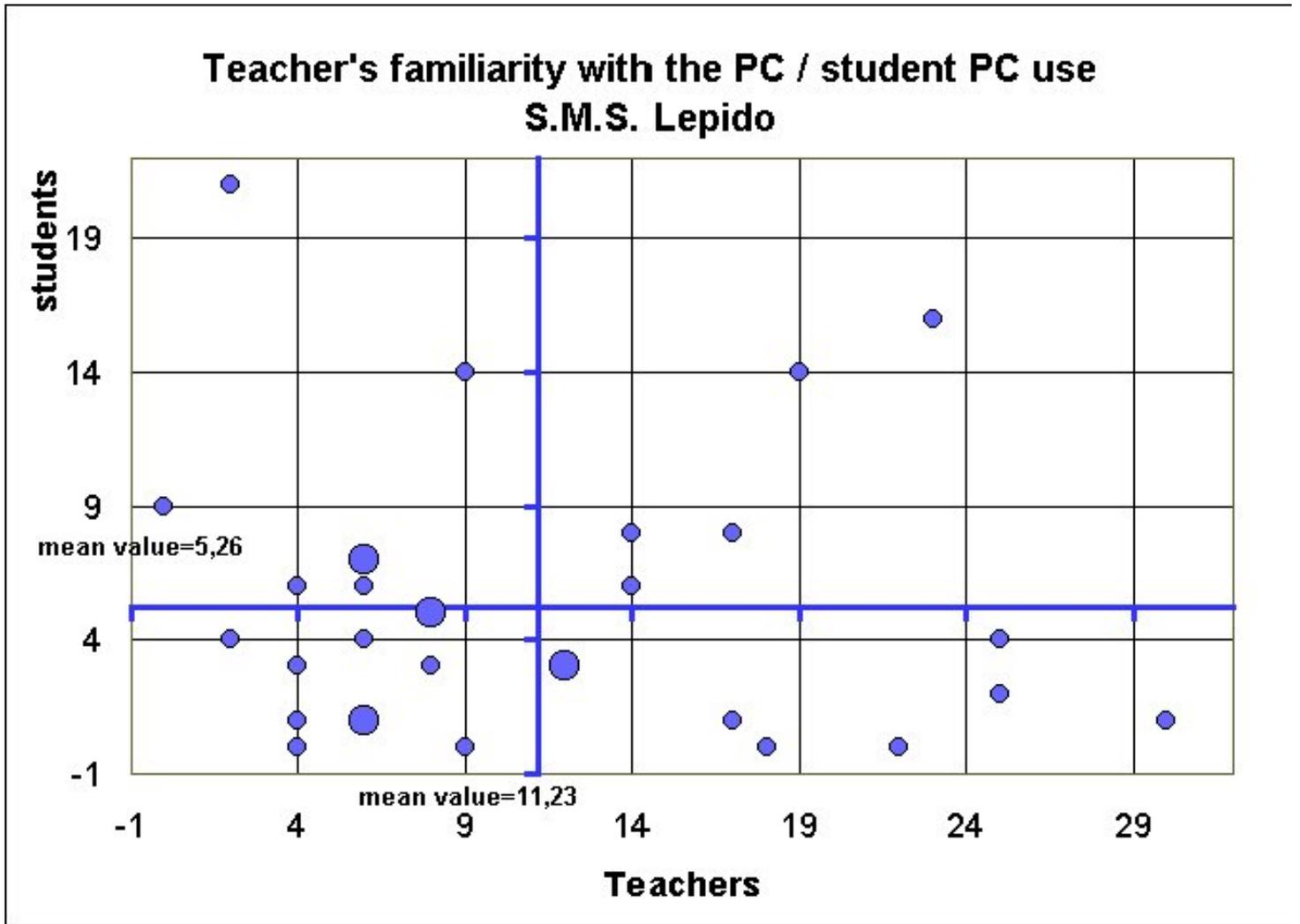


Fig. 8

Per cent distribution of the answers to question 25 concerning the individual computer use by students in the class (what portion of the computer use that you assigned was done by students individually?): all, most, some, very little:

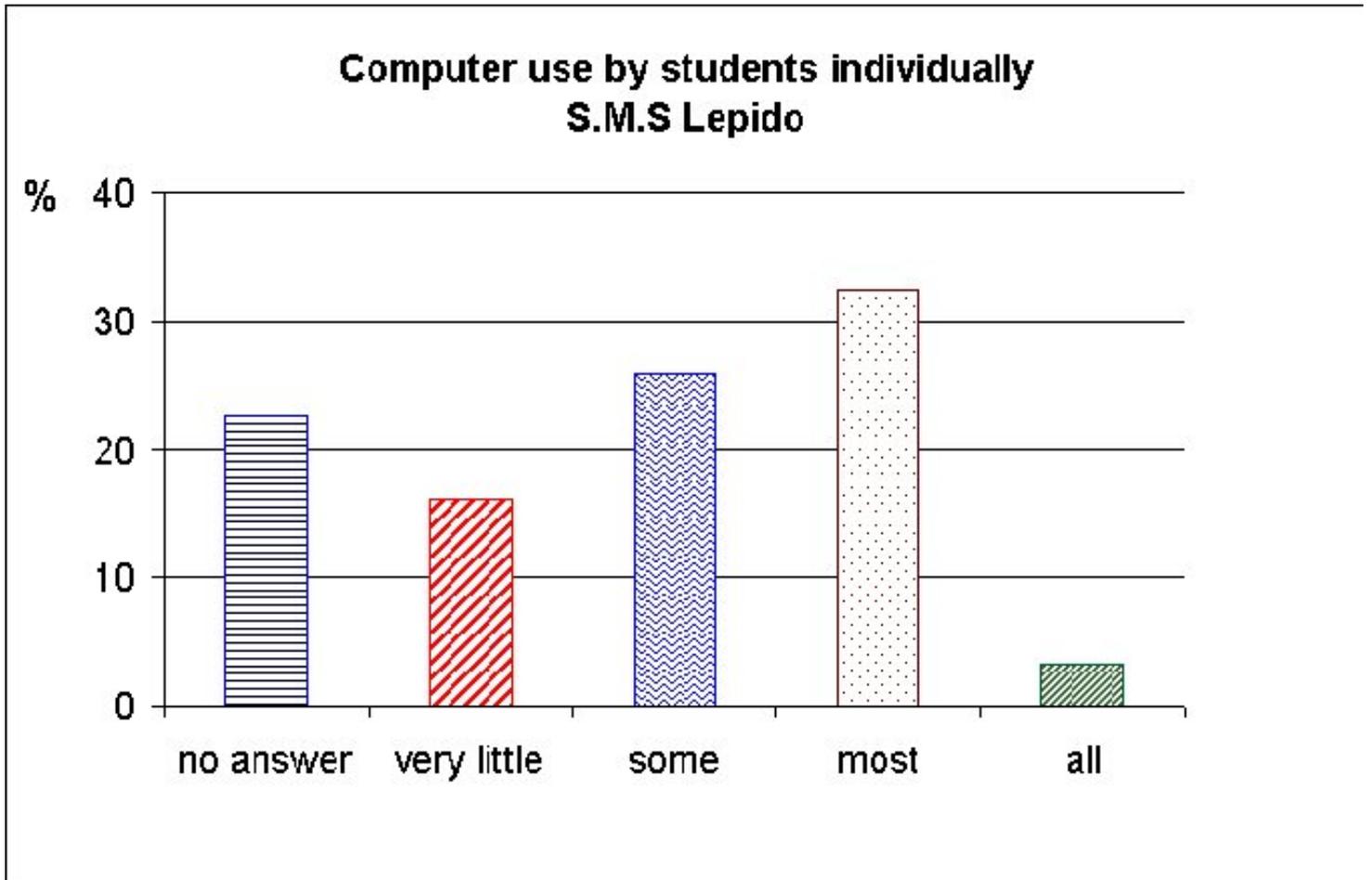


Fig. 9

Per cent distribution of the answers to question 22 concerning the restrictions imposed by teachers as to the Internet access by students (if you assigned World Wide Web searching, how much freedom did you allow students in locating sites to visit?): no restrictions, some restrictions, designated sites only:

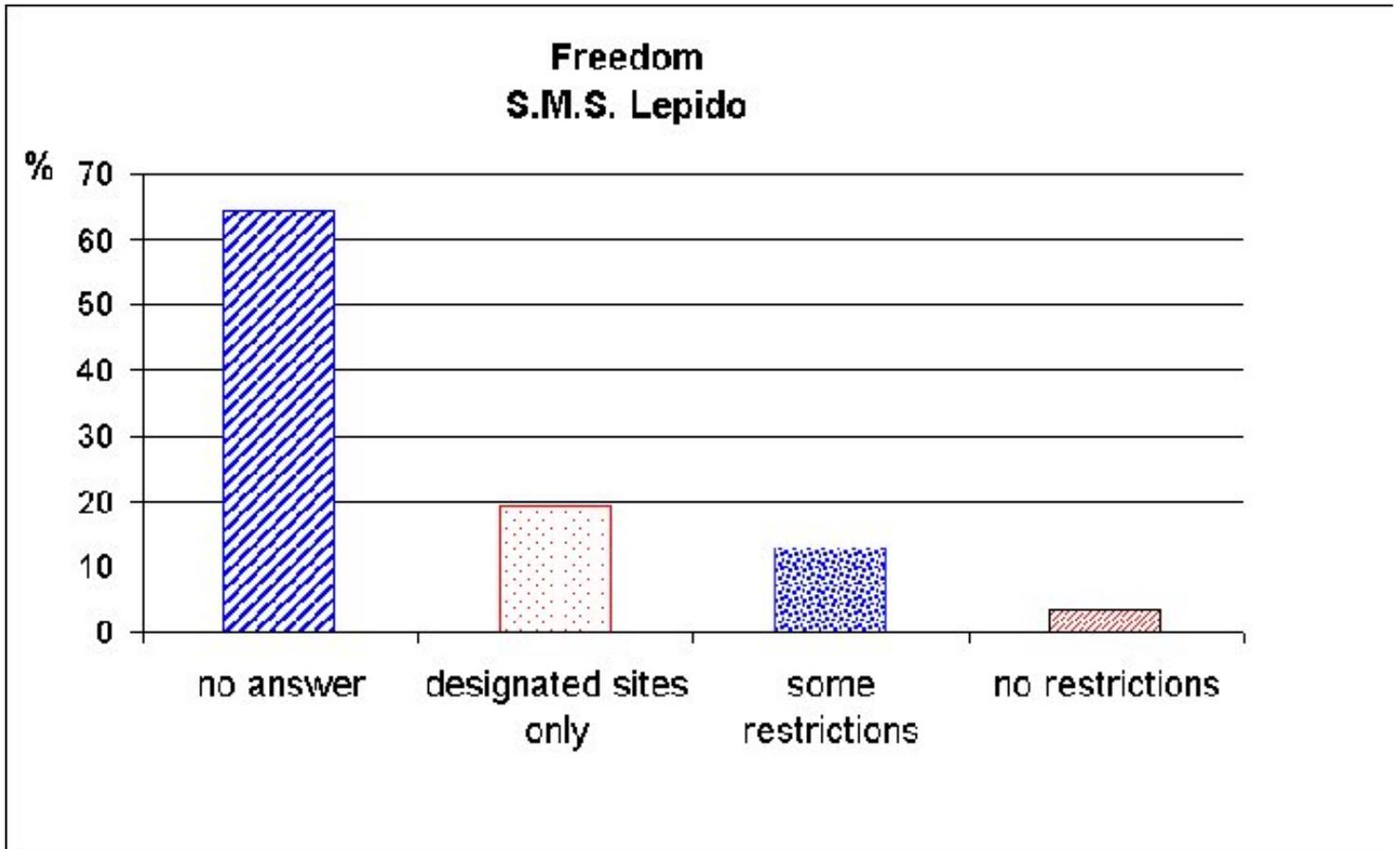


Fig. 10
Per cent distribution of the answers to questions 9-19 concerning computer use by students in the class. The situations where no response was given as regards to a specific application were not taken into account:

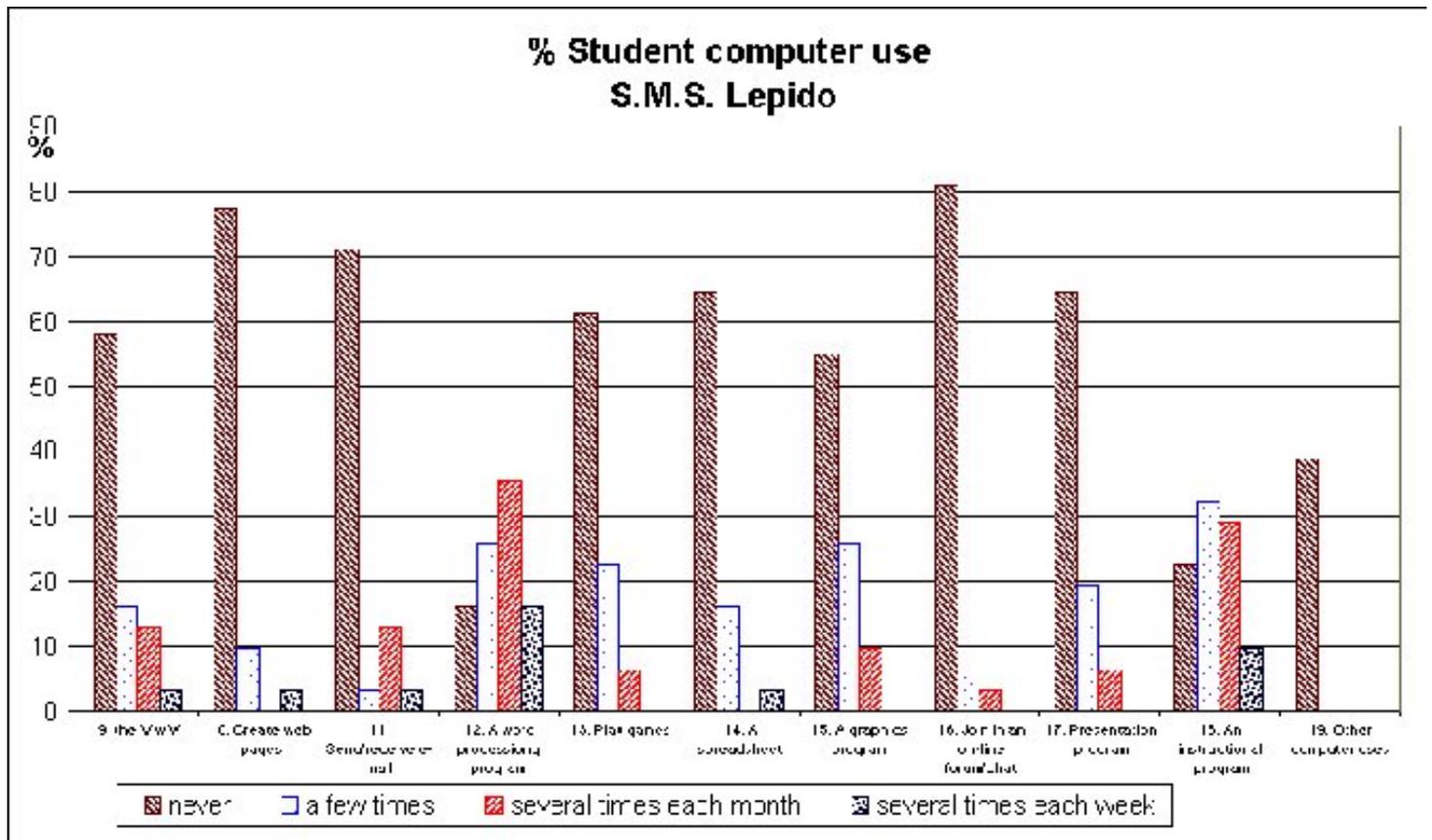


Fig. 11

Per cent distribution of the answers to 31a – f questions concerning the teachers' technical skills and uses. The questionnaire suggested to answer giving a score from 1 to 5:

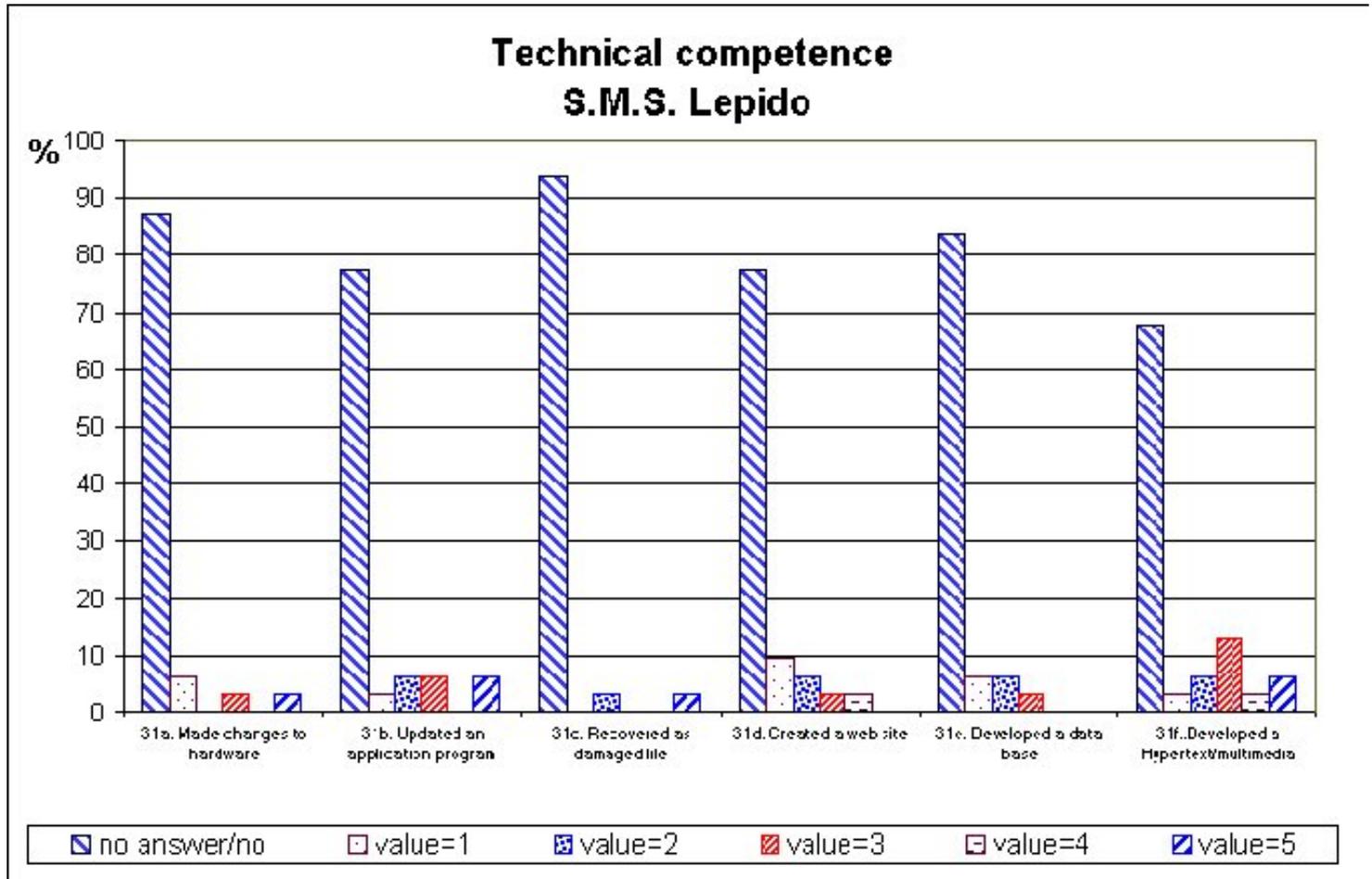


Fig. 12
Per cent distribution of the answers to question 20 concerning the teachers' self-evaluation about their computer use skill (How would you rate your ability to use a computer? Choices are: good, fair, poor):

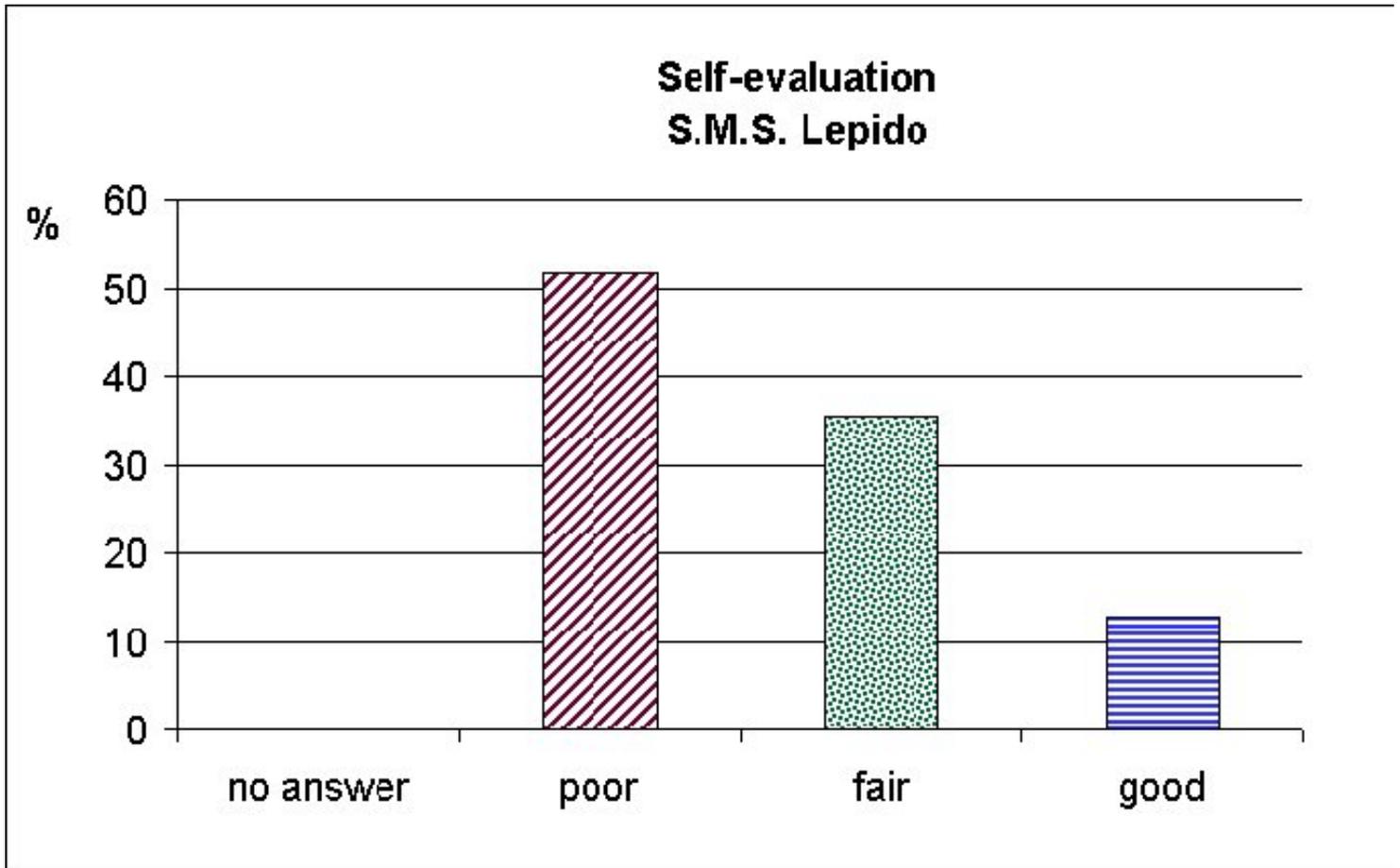


Fig. 13

Per cent distribution of the answers to 1–8 questions concerning the teachers' familiarity with the computer use in different contexts. The situations where no response was given as regards to a specific application were not taken into account:

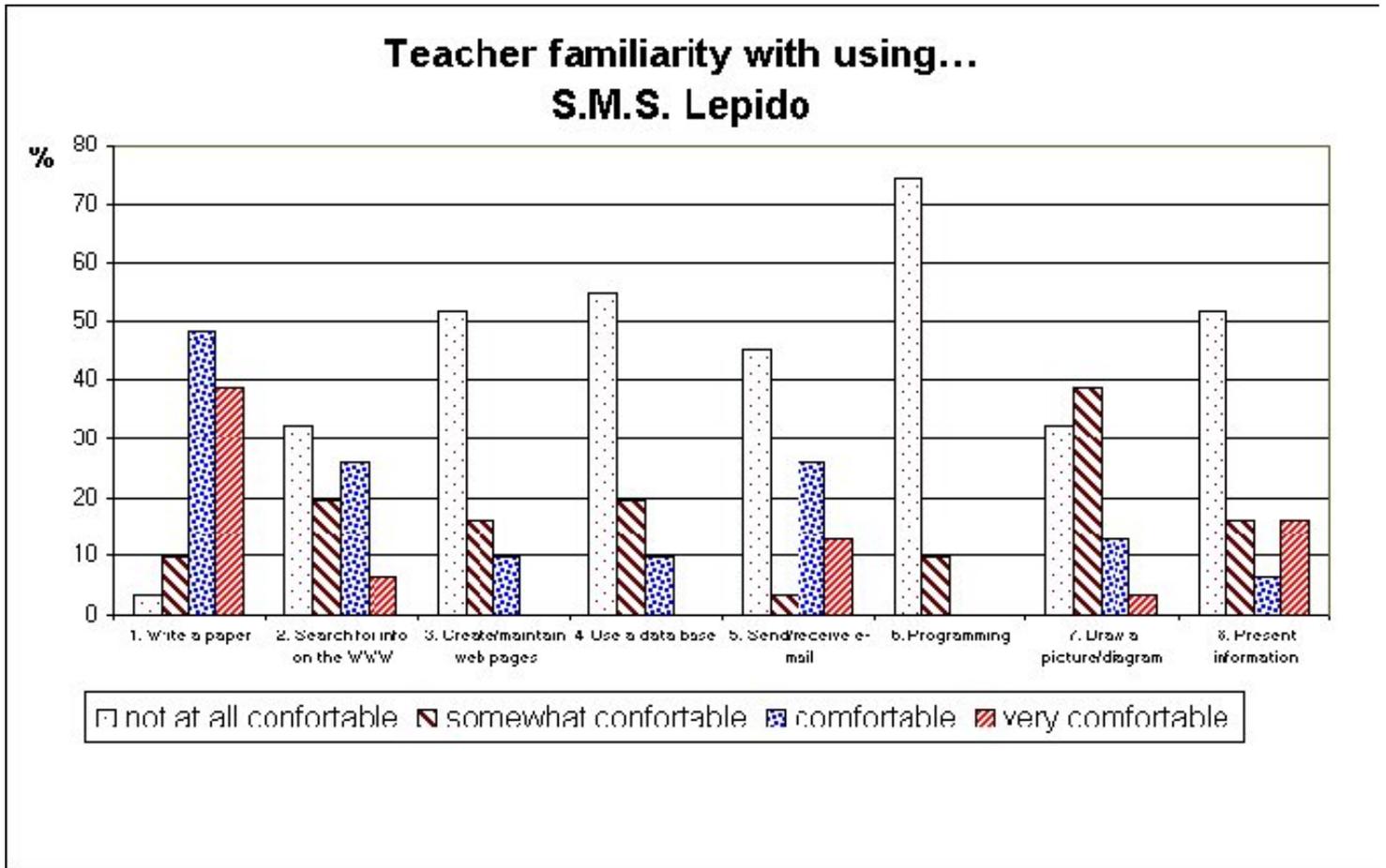


Fig. 14
Per cent distribution of the answers to question 30 concerning the daily e-mail messages received by teachers (how many e-mail messages total do you send each day on average):

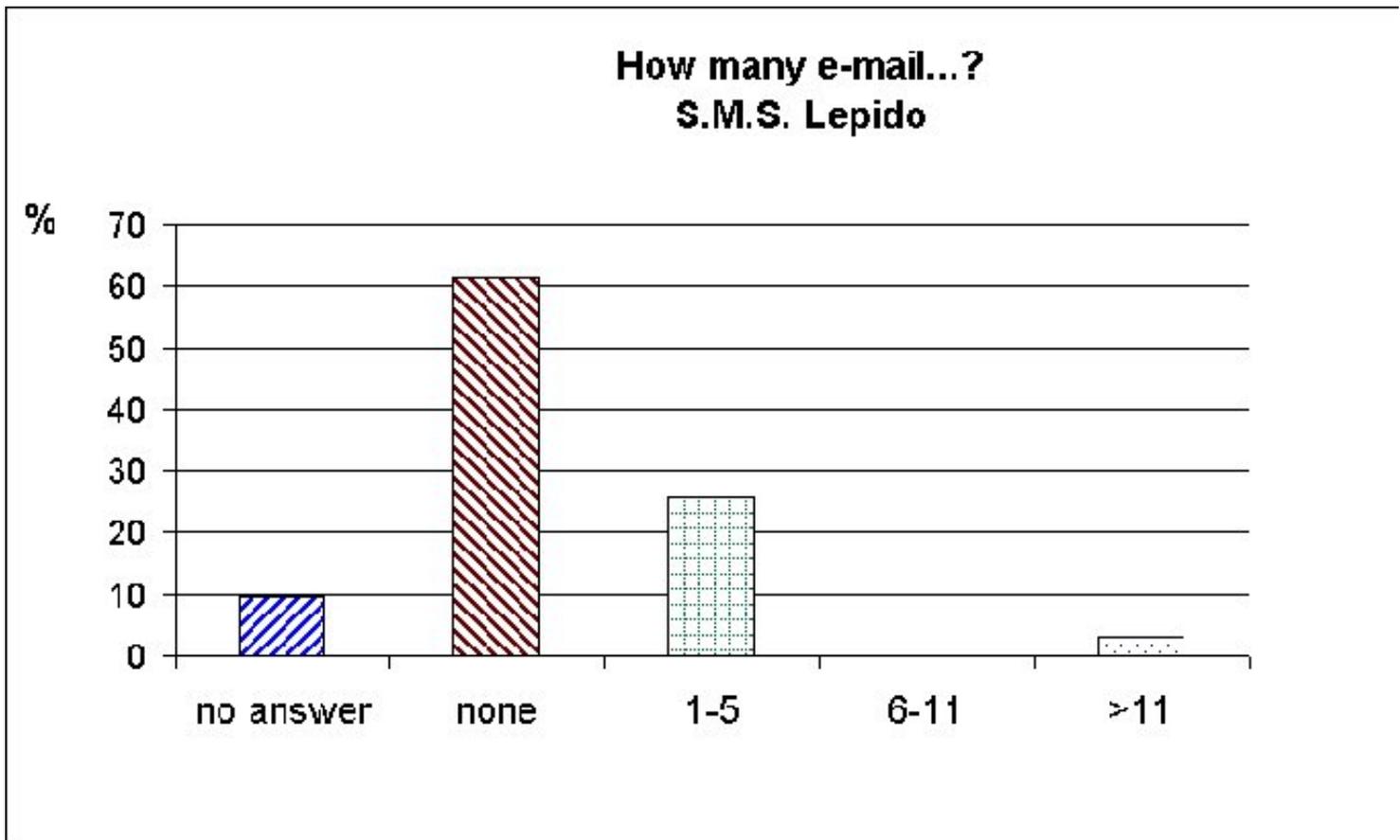


Fig. 15

Per cent distribution of the answers to question 26 concerning the teachers' computer use at home to prepare their lessons (how often did you use a computer at home for preparing for teaching?):

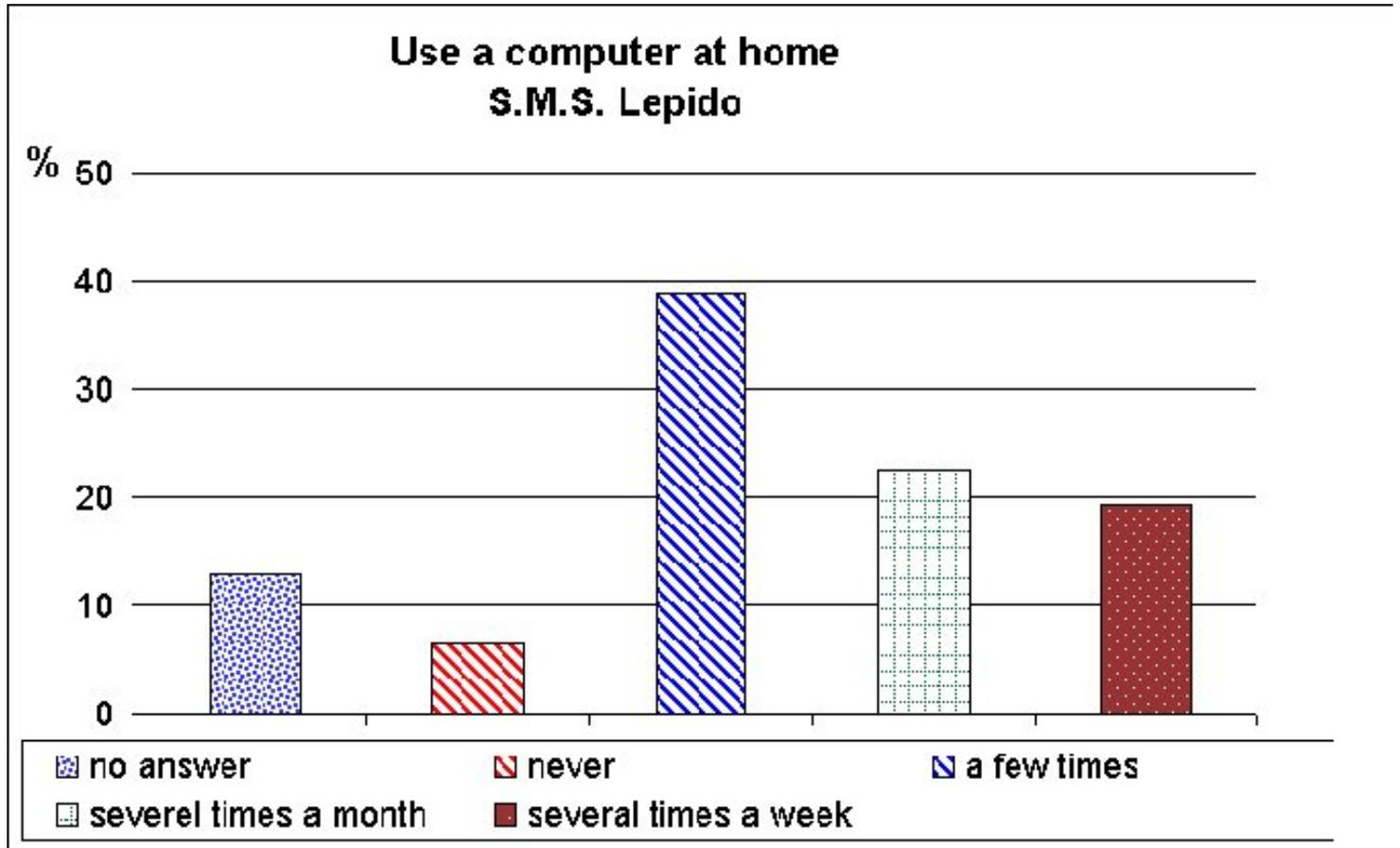
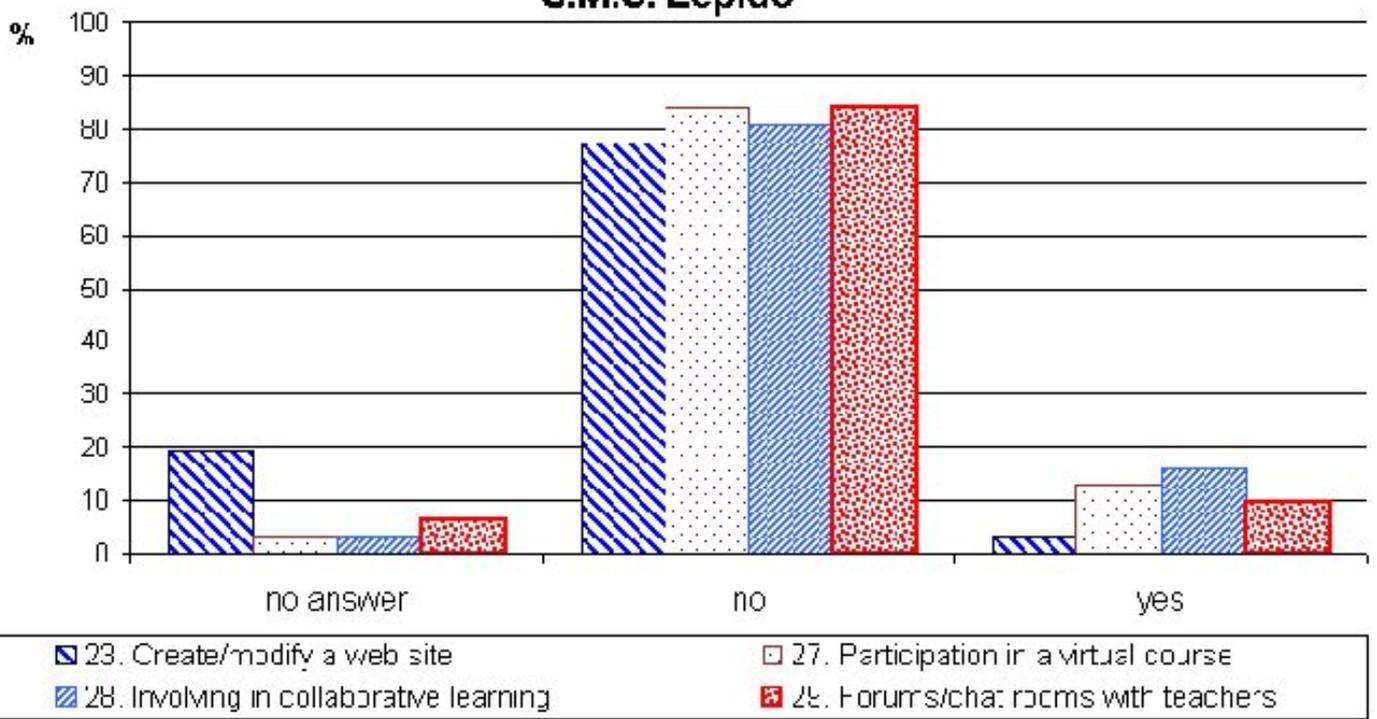


Fig. 16

Per cent distribution of the answers to the question about ICT activities by teachers within their professional training courses (question 27 and 29) or about their work with the classes (questions 23, 28):

Questions 23, 27,28,29
S.M.S. Lepido



Title:
Issue:
Date: