

OECD/CERI ICT PROGRAMME

A Case Study of ICT and School Improvement at  
**G Rodari Primary School – Udine- Italy**

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## Overall view

>From the interview with the students attending Rodari Primary School until the school year 1999/2000 and now attending the first class of the secondary school.

Interviewer: which kind of efforts did your school make in the last few years in order to improve its didactics and functioning?

*Here I have learnt how to make friends with others, to have a good relation with teachers and to use the computer surfing the net alone.*

Interviewer: But does not the school serve to learn history, Italian and maths? Could you state to have the same knowledge of history, Italian and maths as your new mates?

*In my opinion we have learnt the same amount of information learnt by other children, but we learnt it in a different way, maybe funnier and more relaxing.*

The logo of Gianni Rodari Primary School designed by Francesco Tullio Altan<sup>1</sup> represents two children aboard a book sailing towards new worlds. Altan has also illustrated some books by Gianni Rodari (1920-1980) after whom the school is called. Rodari is the author of lovely books for children and of a valuable "booklet", "Grammatica della fantasia"<sup>2</sup> (The Grammar of Fantasy: An Introduction to the Art of Inventing Stories) dedicated to anyone *"who thinks that imagination should have a place in education; to anyone who has faith in children's creativeness; to anyone who knows the value of relief that words could have. "Every use of the word to everybody" seems to be a good motto sounding democratic. This is not because everybody should be artist, but because none should be slave."*

It is just the acknowledged value of the word, written, said or drawn, that explains the large use of ICT in this school: communication among children, among teachers, among children and teachers of the same class, of the school, of the area and so on, until the exchanges with the children hospitalised at Gaslini Hospital in Genoa or those ones in the twinned class in Berlin are included. All this has been the moving cause of the innovation process undergoing for almost 10 years in this school and ICT have been the positive catalyst. The carrier and the places of communication are represented by the walls of this school, of the classes as well as of corridors with their drawings, photos, notes and the garden loved by and crowded with children.

The screenshot shows a Netscape browser window displaying the website for Scuola Gianni Rodari - Udine. The browser's address bar shows the URL <http://formicaio.it/rodari/>. The website has a purple header with the school's name and navigation links: Home, Informazioni, Attività, Giornalino, Guestbook, and Email. A purple sidebar on the left contains a menu titled "Informazioni" with the following items: NEWS, Ultima settimana, Presentazione, Fotografie, Gianni Rodari, Piano Offerta Formativa, Insegnanti, Personale ausiliario, Rappresentanti genitori, Indirizzi di posta elettronica, Calendario ricevimenti, Gite e viaggi, Testi adottati, Menu della mensa, Siti interessanti, and Ringraziamenti. The main content area features the school's logo "Scuola elementare Gianni Rodari" and contact information: "Circolo didattico Udine 4° Udine - Via Val di Resia, 13 Tel/Fax 0432 402636". Below this is a cartoon illustration of two children reading a large book. To the right, there is a drawing of a star and a crescent moon over a yellow landscape, with the caption "I Tre Re Magi stanno per andare da Gesù (Federico 1A)". Below that is a red box with the text "PENSIERO DEL GIORNO" and a quote: "Questa mattina la mamma era venuta per svegliarmi, invece si è infilata nel mio letto e si è addormentata. (Giulia 5B)". The browser's taskbar at the bottom shows several open applications: Avvio, Microsoft Word - reportrod..., D:\ocse\rodari\report, and Scuola Gianni Rodari... The system clock shows 11.11.

There are also labs, such as the one for information technology where classes work, or that one for coordination where teachers meet. Both labs have computers and equipment placed along the walls with a big table in the middle of the room to discuss together, and last but not the least, the school site <http://www.formicaio.it/rodari>.

Every morning all children switch on the computer of their classroom (each classroom has one or two computers, a scanner and a small printer)

They check if it is the birthday of anyone, if their photos have been put on the net and what canteen offers today. As soon as children have a moment of freedom, for example during recreation, or if they finish early the test or are a little bit tired even during lessons, they can switch on the computer, write the "sentence of the day", send a comment to one of the many school's web-forums, send their own contribution to the editorial staff of the school's newspaper or vote for the net-poll. The last



one in December is on Christmas' celebrations: is it better the crib or the Christmas tree? Results are not yet available on the net (20/12/00), but they will be soon presented in the form of histogram together with a selection of the most interesting issues.

Once a week each class goes into the "lab for information technology". There are 11 computers and children can work in groups made up of two, maximum three people for each keyboard. They can surf the net, the youngest use the Intranet almost exclusively, they can consult CD-ROMs, compose hypertexts, participate in forums, chats and videoconferences.

The site on the web has only a little part of Intranet resources, realised almost exclusively by the responsible for ICT, the teacher Pittoni, but it is rich in contributions coming from the work of all classes, teachers, school personnel, children and from the engagement of the manager. All this has the object to let innovation become school culture and not remain the place in which some innovators in the forefront could make experiments.

All this makes possible that also people that are most reluctant to introduce new technologies participate in site's updating supported and helped by colleagues and, as a result, works and photos of classes' activities are regularly input.

In this way the site is a meeting point in a school in which there are many projects and activities including or not the use of ICT: a visit to a museum or a school trip are suggested also by teachers who do not adore computers thanks to the support of the responsible for ICT and of the most expert teachers. On the other hand these initiatives can be shared with everybody through the distribution on the web of related photos and stories; thanks to web-forums they can become object of general discussion within the school. Web-forums are started in order to allow children and teachers belonging to other classes to say what they think on that particular experience, to open a virtual window onto the world outside the school by using the e-mail of the class in order to correspond with children of the school in the town that is the destination of the trip and so on. Parents are satisfied with progress made by their children and most look at the school if not with envy but looking back with regret on the fact that they did not have such chances. The dialogue between parents and teachers is very lively. There are many meeting opportunities and they are



both formal and informal, for example talks on children progress or parties, meetings, chance encounters that are always very agreeable by school personnel. Moreover, during this year it was decided to give more and more place to information of interest for families on the site of the teaching district,<sup>3</sup> <http://www.formicaio.it/>. The school, however, limits the recourse to families' help to extraordinary occasions, such as in the case of the organisation of the trip to Berlin. On this occasion the parents of children attending the fifth class have been involved – and they have offered with pleasure to co-operate. In this way these children are going to repay the visit of the last year by their mates belonging to the twinned German class.

During years this school won a good name within the town – the school has a leading role in putting every compulsory school of the province of Udine on the web – also within the country. After having begun alone, Rodari's personnel has been approached and involved into national and European experimentation and research projects on the use of ICT within the school. Here are some examples: [KIDSLINK](#), co-ordinated by a CNR-Institute in Bologna; [Multilab](#), promoted by the Ministry of Education; Elga, communication project with hospitalised children belonging to a project by the [Institute for Teaching Technologies](#) of CNR in Genoa; [European Schoolnet](#) and others. In particular Multilab project by the Ministry of Education has made the expansion of the innovation easier and faster both within Rodari complex and towards other schools of the same district. Three out of nine district's schools did participate into the project (generally two schools per grade participated in Multilab, that is to say two nursery schools, two primary schools, and so on. In the province of Udine the two primary schools and one nursery school belonged to the same district. Moreover one of the secondary schools was just the one in the same quarter of Rodari school.). Thanks to Multilab, Rodari school could benefit by funds and large training opportunities for the teachers involved.

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## The history

The computer appeared for the first time at Rodari school in 1982/1983 in the class of the teacher Pittoni (in this school since 1976 and responsible for ICT). The interest in experimentation within his own teaching together with his fondness for new technologies caused the introduction of the Logo and of the first few programs. The first few people who actually approached this new reality were teachers of the scientific matters. They were, however, isolated cases looked at almost with suspect. Moreover they had the little available funds to reckon with and this led innovators to come up with projects involving precise fund requests and to enter into an alliance with the largest amount of interlocutors as possible. Thanks to this ability to "self-financing", experimentation was not felt as dangerous or competitive. This is just the characterising feature that will not change in time due to targeted self-financing forms by ICT and promoted by the Ministry of Education. Also the most skeptics always recognise that funds paid for computers could not otherwise have been destined to anything else.

Formicaio project was set up in 1992, some time after the arrival of the current manager. The launch was almost accidental. The responsible for ICT, Mr. Pittoni, at that time only teacher in one class, surfed the amateur telematic web for his own interest. At the end of a debate on communication in his class he suggested to write down further comments since they had no time left to conclude the discussion. They would put up on a notice board slips of paper and then interested people could answer using the same tool.

The colleague sharing the class with Mr. Pittoni that taught humanistic subjects liked the idea. She pushed children to use that communication tool, too. Little by little other interlocutors added their own slips of paper; apart from the wooden notice board, messages were written on a computer, then they were sent to another one in a different class with which the first computer was connected by means of a cable. Eventually

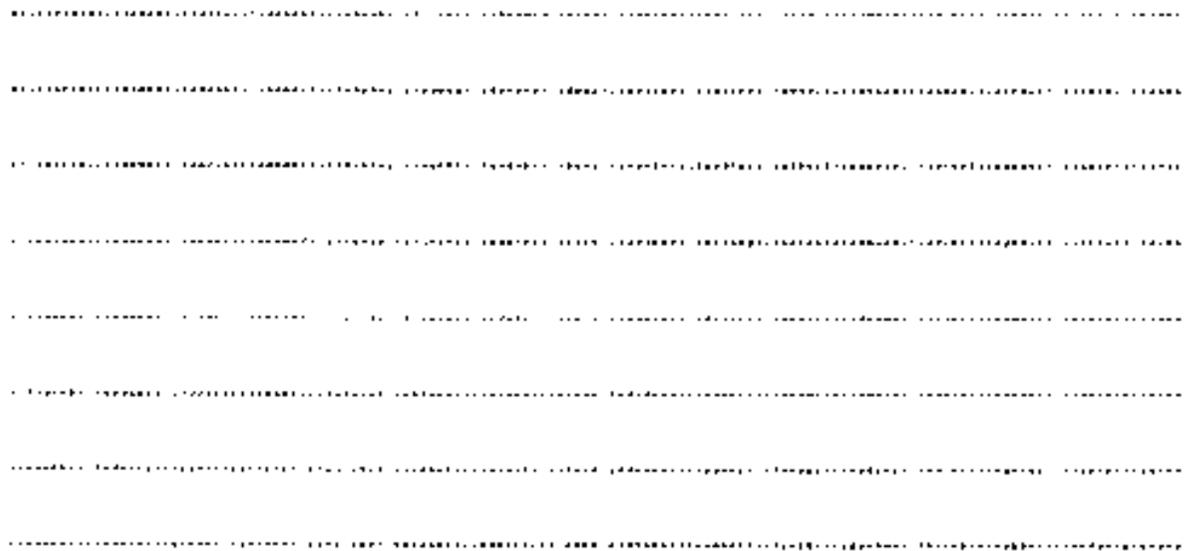
with the help of a local company for information technology messages surfed the telematic web, Fidonet. In this way the communication with other children outside Rodari school was started. On suggestion of an inspector coming from the Ministry of Education, the discussion system developed as project on communication among schools. Within Rodari school the project has been called "Formicaio" (swarm): each participant is an ant bringing his message to the common notice board in the same way in which ants bring crumbs to their nest. Even now that at BBS web-forums have been replaced, the notice board survives with the same rules of virtual communication: messages are written on special forms, attached subsequently on parallel files according to debates and to relating issues. They are then closed in such a way that the addressee only is visible if they are private.

Through Formicaio teachers coming from three schools of the district (Rodari, another primary school and a kindergarten) began constituting a first work team which teachers from other schools would join, in particular from the secondary school of the quarter with which a strong co-operation still exists. The interest in "continuity", that is to say the pledge to assure gradual passages from a level to another one within compulsory school, is shown as one of the ingredients characterising innovators and first few followers (early adopters). In 1995/1996 Fidonet was replaced by the Internet by means of the co-operation with KidsLink project and messages began reaching the entire world. Since 1995 this school has had a own web site. In 1996 Rodari was added to Multilab schools together with the other two schools of the same district that co-operated already into Formicaio project. This made an equipment enlargement and a heavy investment in teachers' training possible.

However the experience of Formicaio was not completely abandoned: Formicaio is the name of the server of the district and of the co-operation project on the net among various complexes of the school.

It is just the organisational structure, the secretariat common to all 9 schools of the district, that played the role of the webmaster of district's web site (the responsible for ICT is the webmaster of Rodari's site). This structure had been very soon involved in the innovation process on information

technology introduced into didactics. Mr. Pittoni had developed a database to handle students' personal data (the one enabling to know day by day students' birthday through the site). The easing and speeding up of administrative work spurred the personnel and, starting from this base, a



significant intervention by the Ministry of Education had been triggered. Such an intervention was aimed at computerising all cases of school administration on the national Intranet. Secretariat staff has been first trained for the initiative taken by the manager and by Pittoni, then through courses organised by the Ministry of Education.

The manager considered difficulties run into at the beginning as usual ones: the way to collect funds to update computers and support continuous training activities of teachers; explaining skeptics that some tools are not due to trends or eccentricity, but they are strictly linked to the activities suggested, making local authorities realise the importance of the undertaken route in order to obtain help and finally to involve everybody. This is necessary in order to make all 9 school work together with the same quality.

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## The present

### "RODARI" Primary School INFORMATION CARD

School name	Gianni Rodari
Municipality, province, region, country	Udine - Friuli Venezia Giulia - Italy
Location	In the suburbs of the town
Kind of school	State primary school. The school is part of the teaching district involving 9 schools (both nursery and primary schools).
Number of students	248: 125 boys and 123 girls. Foreign students: 16.
Budget	691,738,364 Italian lire for the teaching district to be shared among 9 schools
Budget allocated to ICT	There is no specific budget allocated to ICT; 75,000,000 Italian lire have been granted to the school for Multilab project (1996).
Financial sources	Ministry of Education, Udine municipality, Friuli Venezia Giulia Region, Friuli Venezia Giulia, Friuli Venezia Giulia IRSSAE, students' parents.
School staff	27 teachers + 1 part time teacher. The remaining staff depend on the teaching district (principal, secretariat and so on)
Average number of teaching hours	15

School schedule	From 14 <sup>th</sup> September 2000 to 9 <sup>th</sup> June 2001; Monday to Friday from 8,15 a.m. to 4,15 p.m.
Assessment methods	Four-month and final tests
Students' academic performance in mathematics and Italian	
Total number of multimedia computers connected to the Internet	27
Total number of other computers	4
Computers location	11 in the laboratory, 11 in the classes, 1 in the library, 3 in the co-ordination laboratory.

Rodari Primary School belongs to the 4<sup>th</sup> Teaching district of Udine comprising other 8 schools, primary and nursery schools. Among about 1300 district's students, 248 attend the complex of the school analysed by the survey (125 little boys and 123 little girls; foreigners amount to 16). There are 27 teachers (they are all regular teachers having contracts with no time limit with the exception of two temporary teachers. They are all women with the exception of the responsible for ICT. This is, however, the standard in Italy in which the profession of teacher in nursery and primary schools is almost a women prerogative). There is moreover a part-time teacher. This year the responsible for ICT has obtained the exemption from teaching in the class in order to care about the net project of all 9 district's schools. He is an endless founder of new projects to use technologies in didactics, but he has also to care about maintenance and reparation of the hardware. For this school grade there are no persons devoted to technical support, so the teacher responsible for ICT represents the only help for any problem deriving from ICT themselves. Paradoxically Rodari's teachers (female teachers) blame that this year they can rely less on their colleague Pittoni. Once they always knew where to find him since he was in the class. Now he is obliged to go to and fro among the various units of the school in order to give advice on the way to create hypertexts and to repair a jammed printer.

For the time being Rodari is the school which has the greatest number of computers within the district (in the calculation those ones in the secretariat common to all 9 units are not comprised, even if it is placed "physically" in the complex of Rodari). There are 22 multimedia computers with the connection to the Internet plus other 4 PCs without connection. The lab for information technology has 11 computers, classes have 11 PCs (one or two per class with the exception of two out of eleven classrooms). One PC has been placed in the library (by the time being still the teachers' room) and other three PCs are in the co-ordination lab where there are the computer for back-up, the net server, the router and so on). Almost each classroom has a own scanner and printer; if not present, students use net printers and take their prints from other classes. Teachers and students use with confidence digital cameras by means of which they document every activity in an iconographical way. Photos and drawings are also largely used in virtual communication (Intranet pages are very rich in photos picturing classes, children, school places, trips, activities and so on) and in physical one. The walls of all classes are completely plastered over with drawings, slips of paper and posters that are constantly replaced.

Each corner of the school and of the site is evidence of what has been done. Children are curious to see themselves and what other children do, to tell about themselves and to tell others their thoughts, feelings, events. The site is very often updated, even more than once a day and during

holidays. Such a timeliness increases attractiveness and makes the ritual of daily consultation reasonable. Few hours after our arrival into the school a photo of our research team was already on the Internet!

The software used in the school is free-ware or self-produced; this is due to the lack of financial resources but also to the choice of the responsible for ICT. A preference is shown for software easy to use and strictly linked to preferred information activities, that is to say those ones linked to the simplification of children creativity expression, with communication and sharing. Teachers teaches children to create hypertexts using Netscape Composer. The training for the implementation of hypertexts is already developed before the digitising and the creation on the screen: great attention is paid to the guidance for the creation of written and illustrated texts. In many classrooms there are posters created by teachers that are diversified according to students' level picturing the analysis of the characteristics of the novel by Propp. Everywhere in the school there are drawings representing sentences and sentences "interpreting" drawings as captions. Interviewed children tell about their passion for reading and writing. Besides Formicaio (for the net of one district) there are other two projects common to the Plan of the Formative Offer, that is to say the one on the promotion of reading and the enlargement of the library, and another one on interculturalism. The latter goes from the integration of foreign children to twining activities with classes from other European countries through the recovery of cultural tradition of Friuli region<sup>4</sup>. The publication of the web newspaper allows the organisation and the rationalisation of all proposals.



Scuola Gianni Rodari - Udine - Microsoft Internet Explorer

File Modifica Visualizza Preferiti Strumenti ?

Indirizzo <http://formicaio.it/rodari/> Vai

gianni rodari

Home Informazioni Attività Giornalino Guestbook Em ail

**GIRAMONDO RODARI**

**DICEMBRE 2000**

- Allacciatevi le cinture
- Intervista ad Annamaria
- Realizzazione pigotte
- Volevo essere un'altra...

**GIRAMONDO RODARI**

**NOVEMBRE 2000**

-  Intervista ad Alibegovic
-  Dialogo dell'accoglienza

**OTTOBRE 2000**

-  Rap di benvenuto
-  Festa a scuola

Formicaio 1999/00

Formicaio 1998/99

Formicaio 1997/98



Il **giornalino** ipermediale della scuola Gianni Rodari di Udine quest'anno cambia nome. Si chiama **GIRAMONDO RODARI**. Pubblica testi, ma anche disegni, fotografie, video e suoni, utilizzando la rete intranet che collega tutti i PC disponibili. Ha lo scopo di favorire la **riflessione** e la **comunicazione**.

I bambini che ci lavorano e fanno parte della redazione sono delle classi 5A e 5B. A questi si affiancheranno in seguito anche alcuni bambini delle classi quarte che riceveranno il "testimone" il prossimo anno scolastico. Nella stesura degli articoli c'è il contributo dei bambini di tutta la scuola. La redazione riceve il materiale lo seleziona, lo revisiona e lo pubblica nelle diverse rubriche sotto elencate. Coordina il lavoro la maestra **Gabriella Camera**.

**EDIZIONE STRAORDINARIA** (Marco 5B Chiara 5A)

In questa rubrica escono dei numeri monografici che prendono spunto dalle richieste dei bambini o da avvenimenti importanti.

**POSTA DEL CUORE** (Alessandra 5B Lucrezia 5A)

E' un angolino per le "cose personali", le richieste di aiuto, i consigli... Se gli argomenti sono molto personali si può firmare con uno pseudonimo.

**CRONACA DENTRO LA SCUOLA** (Pietro 5B Daniele 5A)

Racconta quanto avviene all'interno della scuola, i fatti salienti, i problemi che riguardano tutti. Sarà anche un momento di riflessione.

**VICINO LONTANO** (Simone 5B Gianluca 5A)

Raccoglie e racconta le notizie dal mondo, gli usi e i costumi, le tradizioni, la cucina dei paesi lontani. Anche i racconti di viaggi fatti o da fare.

**HO LETTO HO VISTO** (Sara 5B Gabriella 5A)

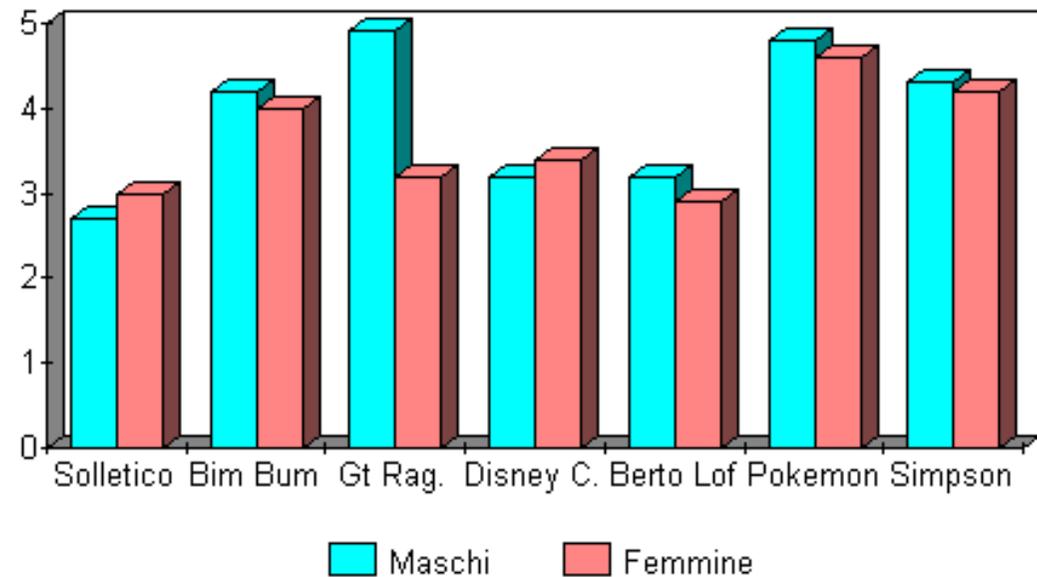
Recensioni di libri, spettacoli teatrali, mostre, film.

The editorial staff of the newspaper is made up of 10 children attending the two fifth classes. The pairs are made up of a little girl and a little boy coming from the two divisions and are responsible for each fixed section: 1) the special edition with news on particularly interesting events (the last one regards the recommendation to fasten seat belts and tells about the accident occurred to a child of the school); 2) love letters; 3) news within the school; 4) "near-far" with stories from all over the world and on children travels; 5) "I read, I saw" with reviews of books, movies, CDs and so on. All children of the school can send their contribution to the editorial staff. It is sufficient to select the section to which they want to write. Once a week the editorial staff meets, discusses about contributions, selects and pages them up adding both drawings sent with stories and the ones expressly commissioned to classmates because according to children *"texts without drawings are not so nice"*.

Besides writing for the newspaper, children write at the PC to vote for the net-poll. This is a survey on issues that could be interesting for children (the favourite TV program, what to do during holidays, which is their favourite snack and so on). Results are then published on the site in the form of histogram.

Some forums are run together with the various projects, for example the one on Friuli region's folklore or the project on letters in English or on Orienteering project shared with nursery and primary school and so on. Moreover the slips of paper used at the very beginning and hanged over the notice board making in this way children getting used to BBS are now used in first classes to accustom the youngest to writing according to a predefined format. Indeed they have to define each time "Addresser", "Addressee", "Subject", "Date". They should be used to a kind of writing being first of all "communication". In December, that is to say just three months after the beginning of the school year, children of the first class make sentences that write in capitals on these slips of paper helped by teachers. Then they decide on whether or not these sentences will be sent

to site's section "Sentence of the day" or to the "web forum for first classes" (it is entirely written in capitals so that the youngest could be able to understand it). Children take turns with others at the keyboard. However they do not take part all in this step, only children writing in the best way. Anyhow everyone will have his own story on the Intranet at the end of the lesson. In this way children can understand the difference between writing for themselves and writing to others. Both expression forms have a communicative potential but they are expressed in a different way and so punctuation's role is simplified. Question marks are usual when writing to others whereas sometimes exclamation marks are used to express personal feelings. Computer is like a ferry-boat towards the outside of class' activities, but computer, particularly the Internet, is the "materialisation" of interlocutor in writing. The richness of the site in the Intranet as far as offered sections are concerned represents the "motive" of writing. Children develop the "need" to write still before being able to do it well, in the same way in which language develops. Teachers being more reluctant to apply innovations criticise the function of writing by means of a computer. They think it is untimely because children are still



unable to write perfectly in their own hand. On the other hand other teachers explain that the chance to watch on the screen what is written, correction's easiness and the great impulse represented by the use of PC are completely exploited in order to teach spelling.

The lab, open to each class once a week, allows all children to learn using PCs individually, to practice keyboard, to surf the net, to take photos and drawings with the scanner, to use CD-ROMs and so on. Although at the beginning computer was introduced to teach maths, today the use strictly linked to subjects has been very reduced. Children tell about maths games or about problems' archives that they set up with their teachers. Something has been developed about teaching of foreign languages appealing to the interest captured by correspondence with children from other countries. On the other hand the creation of hypertexts involves each subject and corresponds mainly to the desire to document all activities.

On PCs there are no games. This is not due to a refusal of the game by itself, also because activity at PC is considered as something playful and pleasant. The lack of games can be explained by the fact that children can play also at home and generally know already games. On the contrary the school wants children to be trained to communicate and to work together with others.

The long time spent at school allows all children to use computers, if required. Children show a kind of awareness, very similar to adults' one, of the characteristics of the different communication tools. Net poll is the favourite section whereas the most visited web forum is the one on "free chat". Telematic messages to teachers are unusual, but sometimes they have been used by children who did not manage to broach a subject verbally because of shyness and they managed to do it thanks to written communication.

Computer and the Internet are acknowledged by families to be an enrichment. They notice that their children turn out to be more informed, more independent, more curious and interested than people of their age also when they pass to the subsequent school grade.

Work at the computer seems being able to reduce progress differences among children: on the one hand less rich families seem to spend more in electronic games. As a result their children are advantaged as regards manual ability at the keyboard. On the other hand the absolute equity with which children use PCs reduces differences in children progress that in other fields are more significant. Whereas children aware of their difficulties with maths' problem are intimidated and stuck before the white sheet, through the computer everyone tries to solve it anyway.

During the last few years teachers' training has had different methodologies and times. At the beginning courses were organised and they were held by the responsible for ICT or by external teachers. They were mostly aimed at diffusing information technology or at teaching how to use a certain software. Courses were organised traditionally with a clear distinction between teacher and students having as a consequence not very good results. Now a new model has spread out having co-operation as main characteristic. This method has turned out to be the most used thanks to the great responsibility by all colleagues: there are projects joined by the various classes, teachers work together and define a common "product" that at the end will characterise the given project. It could be a party, an exhibition, the district's site or the organisation of a management system involving families or whatever in the case of library's promotion. For each group there is a co-ordinator, usually the most experienced person, helping "apprentices". Despite the satisfaction for what has been made with regard to ICT, teachers are characterised by a great uncertainty. This strikes very much in comparison with the confidence showed by students. Although parents acknowledge that their children learnt to use PC at school, teachers often underline their technological inexperience, their endless need for updating and their mutual dependence. It is not only a question of dependence on ICT responsible. All teachers acknowledge that they would not turn back even if they are obliged to progress slowly. This is due to the fact that many successful activities are strictly linked to ICT or their teaching efficacy is amplified by ICT. According to a hypothesis advanced during interviews the reason for this uncertainty is the rather old age of teachers, about 40-45 years. This would explain such uncertainty, the lack of curiosity and love for risks. Our feeling as external watchers is rather that school personnel undervalues the great importance of co-operation considering a work attitude defined with the adjective "gregarious" as a limit. In a culture like the Italian one exalting individualism and the creativeness of individuals – the myth of Leonardo having in himself all knowledge and abilities – such qualities and co-operative expertise are not very appreciated although today they have become the most requested gifts in the work market.

With certainty neither Mr. Pittoni nor the manager are easily replaceable because their drive towards innovation, fantasy, teaching expertise leading to the use of ICT as well as the great helpfulness and human passion are very special. As already stated in the interview with a teacher, *"they have sown the seeds of the success"* and, as a consequence, the "formicaio" carry on growing.

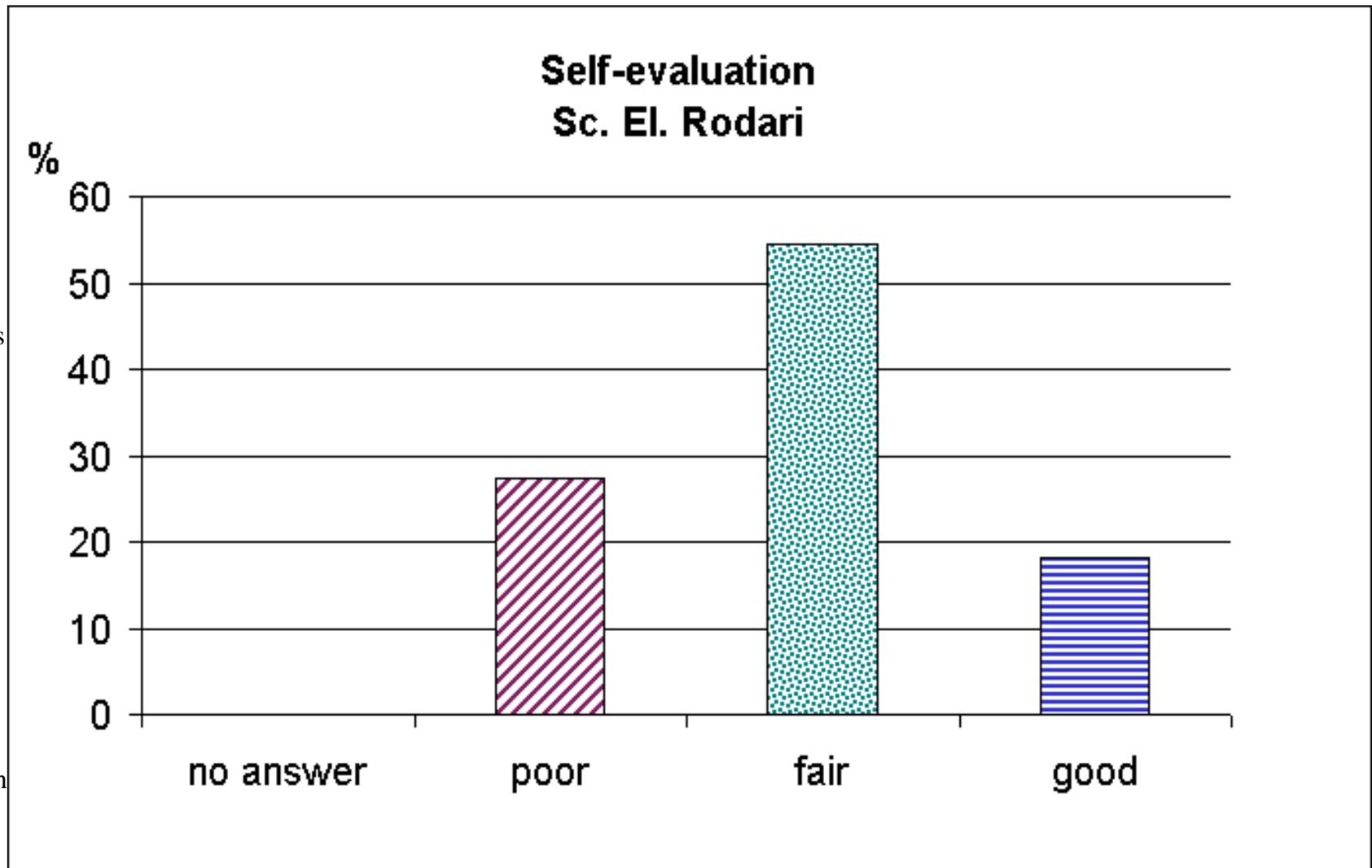
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#### 4. Hypotheses and conjectures

1. In the case of Rodari school technologies seem to have played a role similar to a catalyst even if they have been a tool and not a target of the innovation process. Indeed it is just the amplification of communication processes allowed by the appropriate use of ICT that has characterised innovation carried out by the school. Most activities in primary school are aimed at developing expression expertise, understanding and communication of children. ICT use was univocally aimed at reaching these targets: photos published on the site and the indication of birthdays have pushed children throughout the school to meet; the chance to publish their own drawings and sentences have stimulated expression. This has brought about the elimination of difficulties linked to writing shown by pedagogical research<sup>5</sup>; forums, the newspaper, the e-mail have motivated to communication, have opened school to the world and promoted curiosity, but also the desire to interact and to meet other people both far and near. *"Moreover a very important enrichment results from the presence in the class of computers. This means: today an important event has occurred whenever and we can follow it live. Last year children wrote to Soldini<sup>6</sup> during navigation. All this keeps the school open towards the world and I think it is very important from an educational point of view. All this has also led to a great helpfulness towards others. For this reason the interest in others and curiosity have always been very natural even when we went outside the school"* (from the interview to ICT responsible).
2. Formicaio's achievement process and the ones of the other innovative projects linked to the introduction of ICT show clearly enough the division into innovators, first few followers, first majority and majority plus laggards that today are more and more rare within Rodari and however are involved into innovation processes. Such persons are generally "typical" in processes connected to innovation in the educational field.  
As far as innovators are concerned creativeness should be underlined together with technical expertise but also with a great experience and teaching sensitivity shown by the responsible for ICT. Moreover the engagement of the manager should not be forgotten as well. Both support innovation defending it from external attacks and assuring resources; they direct their efforts to choices' sharing, to the increase in participation and then to projects' spreading.
3. The teaching expertise shown by teachers is beyond doubt the decisive factor. It is a primary school and children competence is very reduced. Infrastructures, as far as information technology is concerned, are also basic enough and not updated. It is important to specify that it is a question of teaching expertise and not only of the ones relating to information technology. Innovation's efficacy lies just in teachers' ability at Rodari to bend technologies for educational purposes; this happens independently of command of themselves.

The support of a responsible for ICT particularly competent and helpful is fundamental. This facilitates work with children in the case of teachers that are less familiar with the use of computers. Teachers acknowledge and accept the fact that children are more capable with the computer in comparison with them, even if children learnt to use it just thanks to teachers, as all parents state.



4. The school did not provide indicators on families' economic situation, but with regard to questions on this issue the answer has been univocally that differences are not on the rise: *"Paradoxically just families spending less on books and magazines spend more on electronic games and so they develop at least the practical and manual ability. The drawback, if it really exists, does not concern technology but the cultural context. It is certain that if families are used to following all cultural events, even if not due to technological reasons, if they take children to exhibitions, participate in debates, participate in activities that could also be outside the school, there is an evident enrichment. However this issue is not linked to technology but to the cultural context"* (from the interview to ICT expert). Access to PCs is absolutely equal to everybody.

5. Children coming from Rodari Primary School do not run into any particular problem when they attend the secondary school. On the contrary parents state that new teachers consider them as particularly gifted. During primary school they used however materials and proposals linked to the Intranet that are very qualitative from a teaching point of view because already selected.
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## **Future projections**

The constant increase in class number and then in schools in the district joining Formicaio project is a good indicator of soundness and enlargement potential of the innovation process. Starting from this year the responsible for ICT at the school takes part in a council of provincial school administration aimed at implementing a net comprising all provincial compulsory schools.

The strengthening of district's net, current Formicaio project, and its enlargement to other schools are the main purposes today. After the abandoning of the Logo teachers show interest in beginning once again experimenting an introduction of ICT more linked to teaching of subjects. In order to do it they feel the need to be further trained, even on the net. On the contrary, the responsible for ICT would like to go into the issue of communication by experimenting other technologies such as television. Everybody would like to have a stronger support and technical resources, starting from the updating of computers and net structure until the presence of a technician devoted to maintenance. There is great concern because sufficient funds are not foreseen to assure both.

However there is still the problem of resistance: all persons who are most engaged, innovators and early adopters, work today with an engagement far larger than individual benefits assured by the reform process (rewards regarding carrier, economic situation and individual appreciation). Such engagement is often larger than their availability in terms of time and energy. While talking with teachers it is possible to feel the fear of "not managing", of not having enough time. This is not due to the presence of traditional programs that should be completed but it is just due to the great amount of ideas and projects. Teachers do their utmost; they can not do more than that.

By doing more and more it seems that in this school the desire to do is on the rise. But who or what can assure that a "breaking load" is not about to come?

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## **APPENDIX A**

### **G. Rodari Primary School – Udine - italy**

As for other schools selected, "Rodari" was initially contacted by the Italian research group's co-ordinator during the period June-July 2000. At that time, a certain number of schools had been addressed, in order to choose those ones to be involved in the study. Among them, "Rodari", given the consent of the school, was finally selected in October 2000, due to the quality of the interrelationship between didactic innovation and ICT use.

*In November 2000, the school was contacted again by the operator who was charged to carry out the study. Dates and formalities concerning the meetings were fixed by phone and e-mail. E-mails have always received prompt answers and as soon as the period of the visit was arranged, both*

*appointment and reference to the OCSE research web site was put in the school web site.*

In agreement with the principal, it was decided to limit the study to only one school of the local didactic area, exactly Rodari primary school, because it was the school where the reform process had already started and involved the majority of teachers as well as all the classes. Only one researcher visited the school and conducted the interviews on December 13<sup>th</sup> (9 a.m. - 7 p.m.), 14<sup>th</sup> (9a.m. – 6.30 p.m.) and 15<sup>th</sup> (9a.m. – 1 p.m.). The responsible for ICT and the principal had prepared a schedule both for interviews and class observation on the basis of the requests received. The schedule was slightly modified to include the interview to administrative staff and to enlarge the number of teachers involved. During the visit the roles were sometimes inverted: the researcher was interviewed by some little girls of the school tabloid editorial staff and by the local newspaper journalist who, during the period in which the study had been carried out, had published an [article presenting the OCSE research](#) in the issue of December 15<sup>th</sup>.

Interviews were both published; the first one on the [school tabloid](#), on December 19<sup>th</sup>, the second one again in the "[Gazzettino](#)", Friuli issue, on December 21<sup>st</sup>.

All the interviews were recorded except for the second part of the interview to the responsible for ICT because of technical problems; as for the class observation, notes were taken using only in part the forms suggested after July workshop.

The interviews texts were exactly written out and introduced in the research group discussion list to be submitted to the analysis of the whole group. The school questionnaire data, as for other schools, were worked out by another research group's researcher. Interpretation of graphs, responses to suggestions and style of all the reports were discussed by the whole group during plenary assemblies in July, before Delaware workshop, and at the beginning of January, as well as during the whole research period, through the rich mailing developed about the discussion list.

#### Meeting schedule - December 13<sup>th</sup>

Interview	Responsible for ICT	1h:15'
Meeting	Principal and responsible for ICT	30'
Class observation	VB (presentation of the tabloid editorial staff)	1h
Interview	Principal	1h
Meeting	Interview to the researcher by the VB editorial staff	30'
Interview	VB students	30'
Interview	Teachers (first supporters)	45'
Interview	VA Students	30'
Interview	IIIA Students	30'
Interview	Ex-students' parents	45'

Interview	Ex-students	45'
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Meetings schedule - December 14<sup>th</sup>

Class observation	IA (without the use of computer)	1h
Interview	Responsible for ICT about Intranet characteristics	45'
Interview	First majority teacher	45'
Class observation	IIB	1h
Class observation	IIIA	1h
Interview	Secretarial staff (school webmaster site)	30'
Class observation	IIIB in the information technology laboratory	1h
Interview	Parents (their son in V)	30'
Interview	Parents (their daughter in V)	30'
Interview	Parents (their daughter in IIIA)	30'
Interview	Parents (their daughter in III)	30'
Meeting	Check on the interview to V editorial staff is requested	30'

Meetings schedule - December 15<sup>th</sup>

Class observation	IA	1h
Interview	Principal	45'
Interview	Teacher (first supporter)	45'
Interview	Teacher (reluctant)	45'
Meeting	"Gazzettino" journalist	30'

During the class observations (except for one situation displayed), the interviewers had shown the kind of computer use generally done by

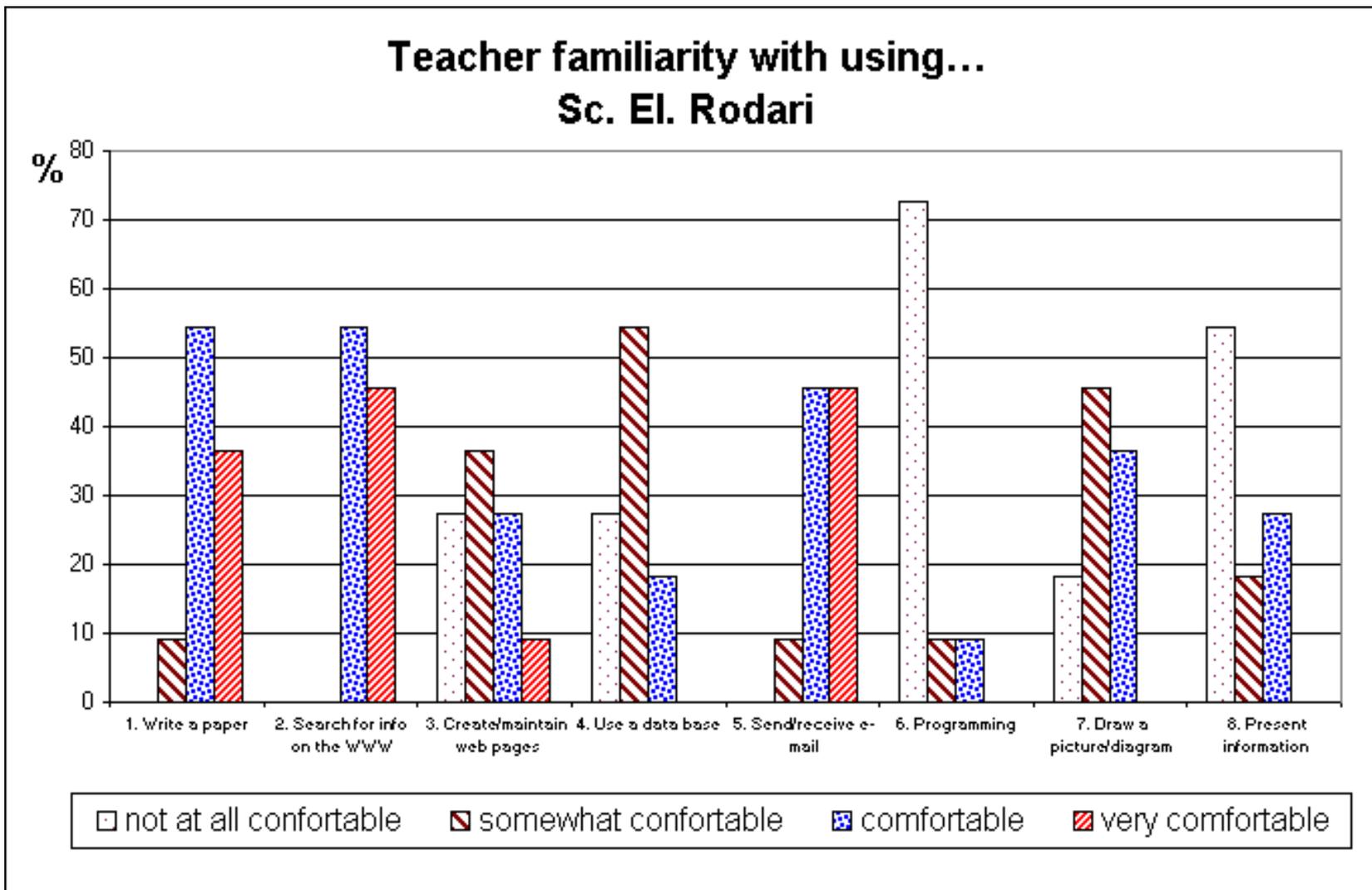
children or told about the projects documented on the site.

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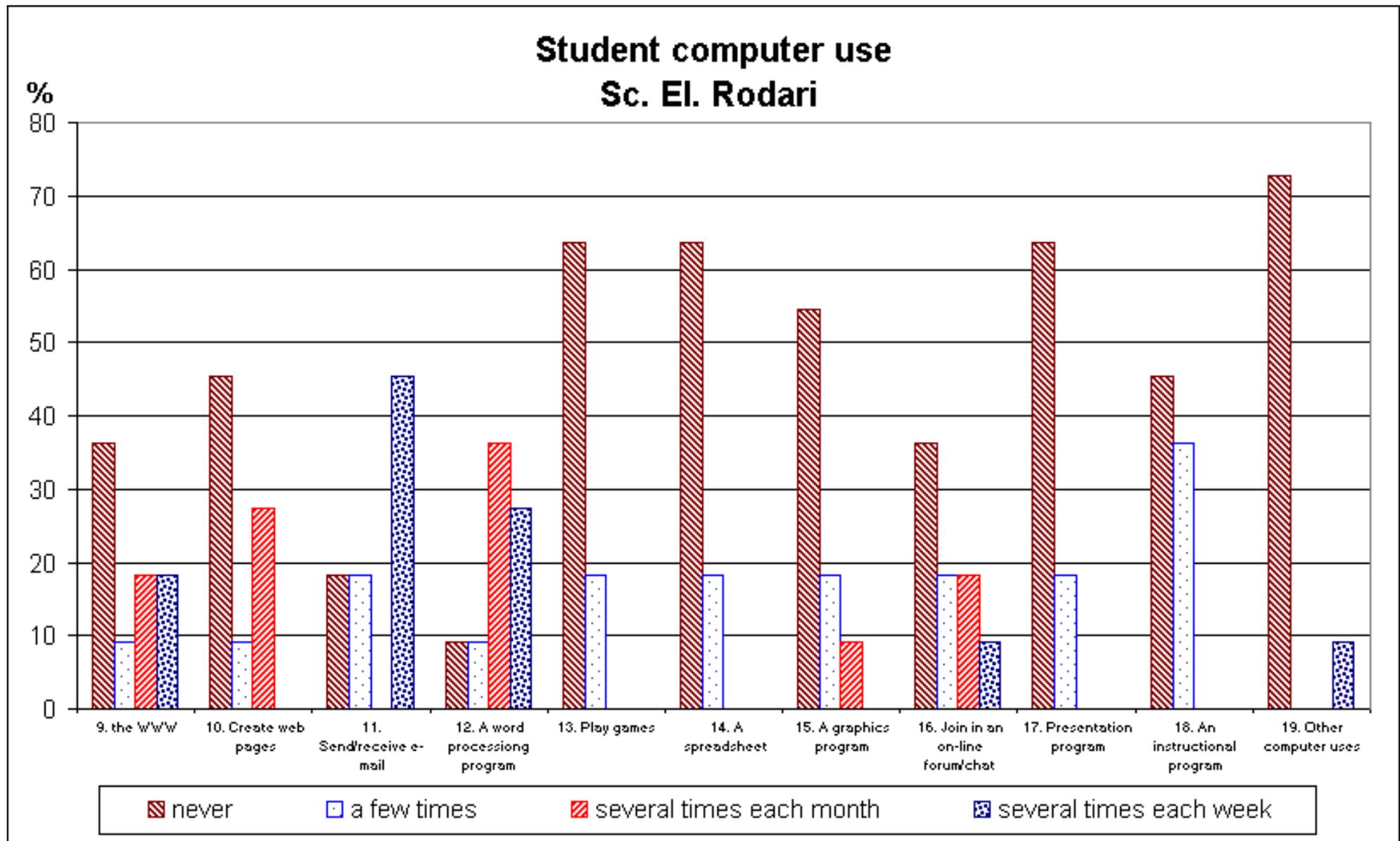
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## APPENDIX B

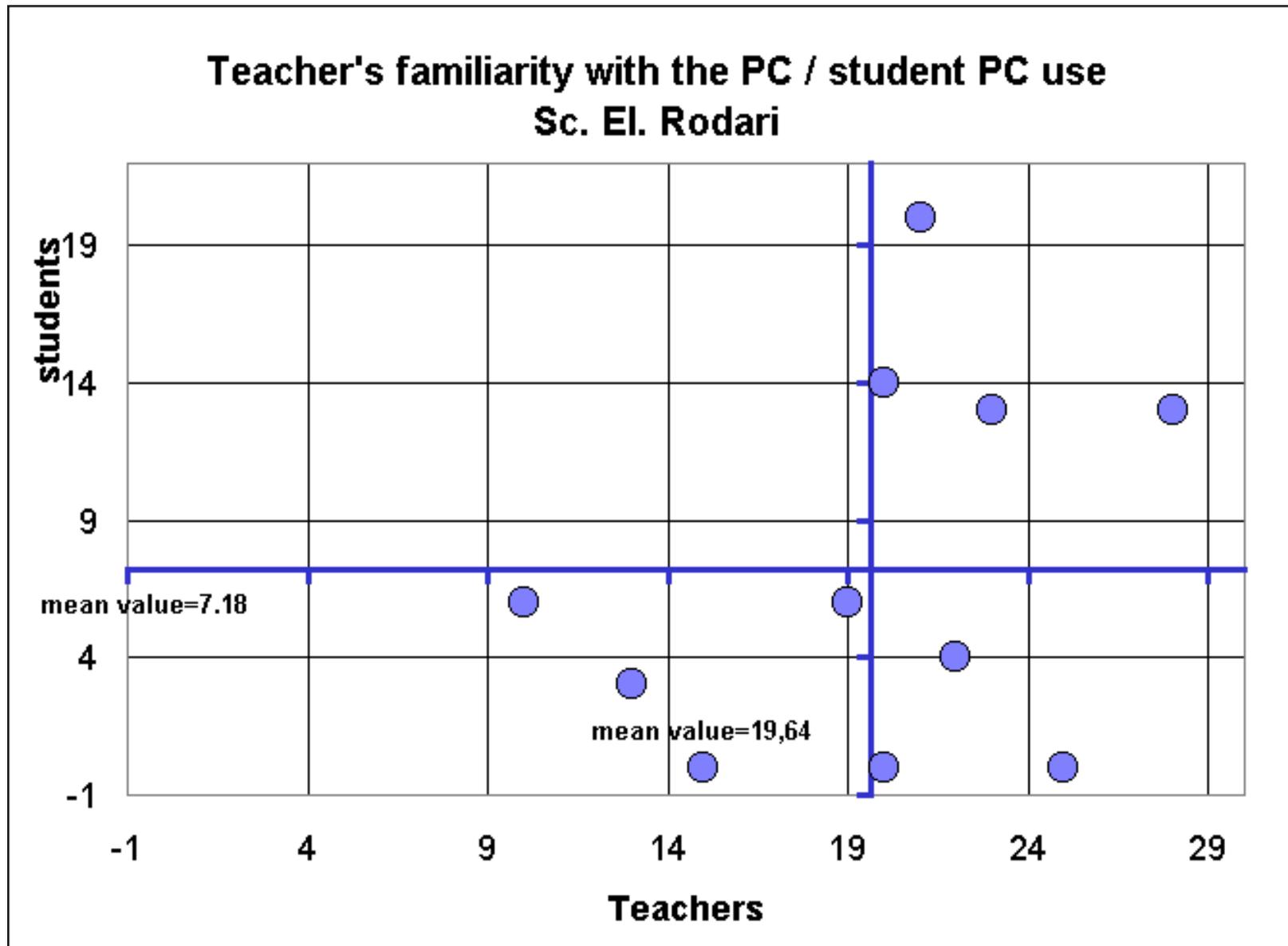
ITIS Rodari – Udine - Italy



**Figure 1:** 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.

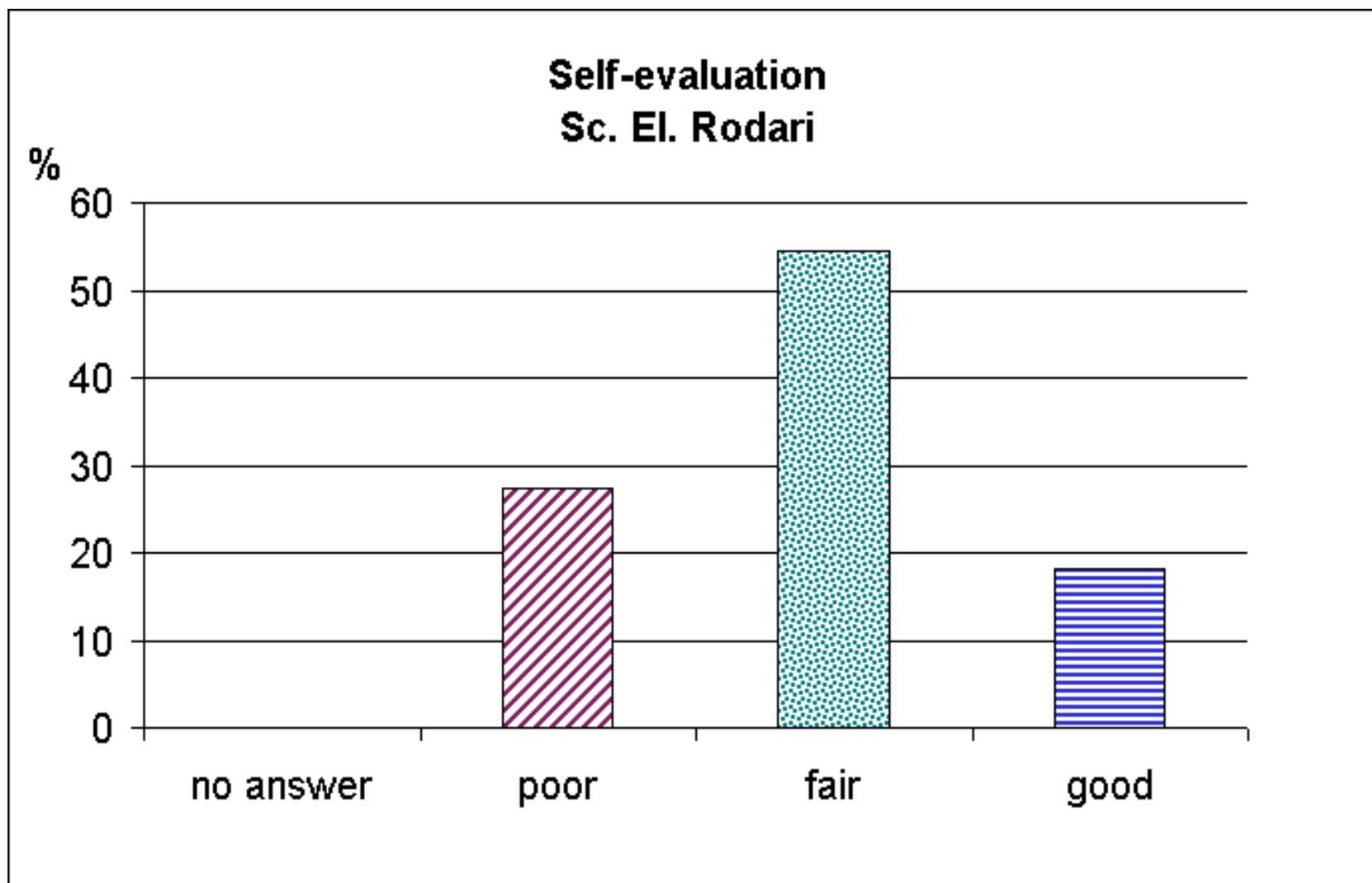


**Figure 2:** Per cent distribution of the answers to questions 9-19 concerning computer use by students in the class. The situations where no response was given as regards to a specific application were not taken into account.

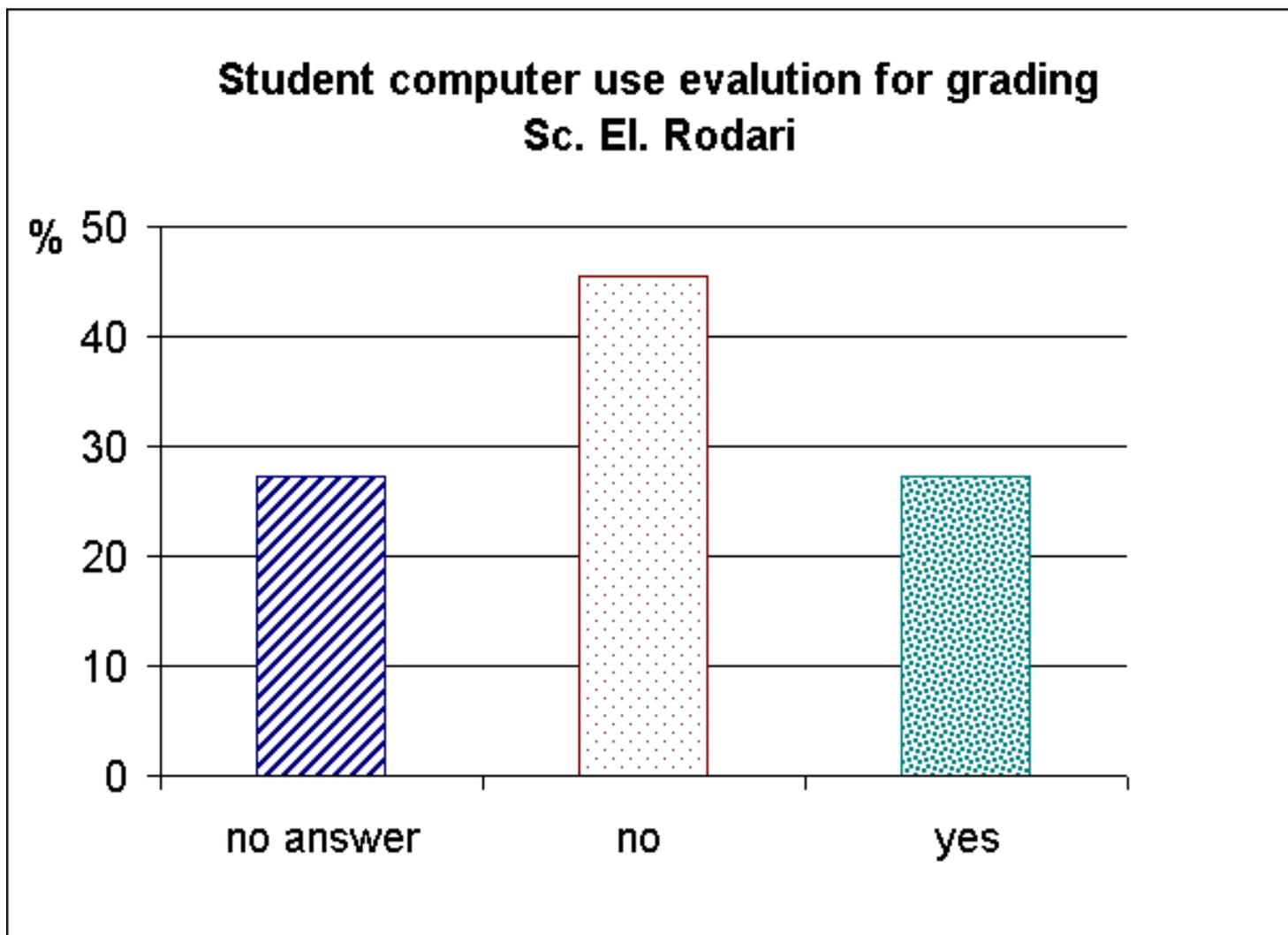


**Figure 3:** Relation between the familiarity of teachers with the computer (questions 1-8) and their use by students in classes (questions 9-19). The answers 1-8 were assigned a score from 0 to 3 for the possible values of answer (no familiarity, a little, enough, much). Furthermore, these scores have 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. The points lying in the 2<sup>nd</sup> and 3<sup>rd</sup> quadrant graphically display the poor knowledge and use of the computer by the teachers; which doesn't necessarily mean an obstacle to its use

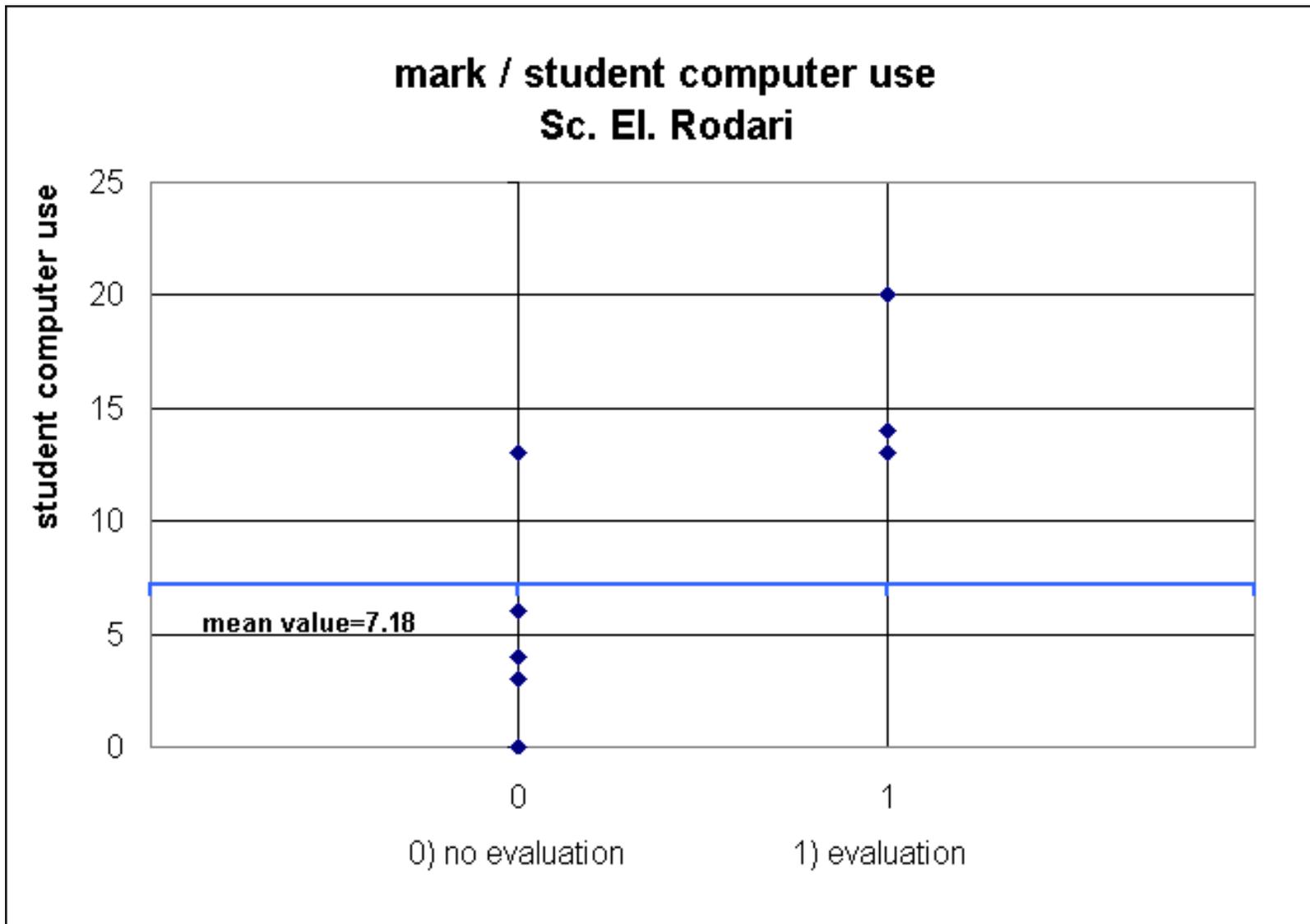
suggested to the students in the class.



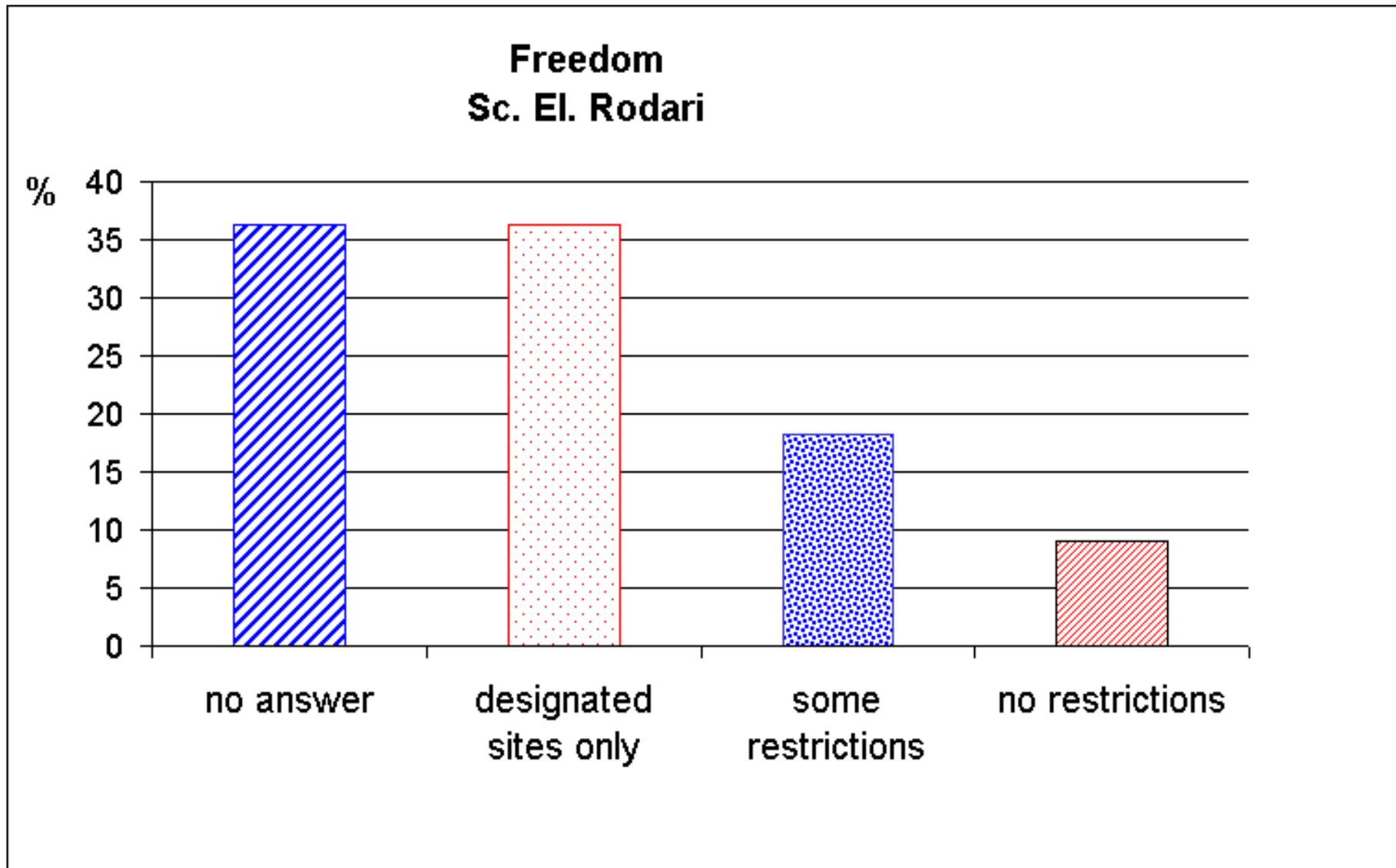
**Figure 4:** Per cent distribution of the answers to question 20 concerning the teachers' self-evaluation about their computer use skill (How would you rate your ability to use a computer? Choices are: good, fair, poor).



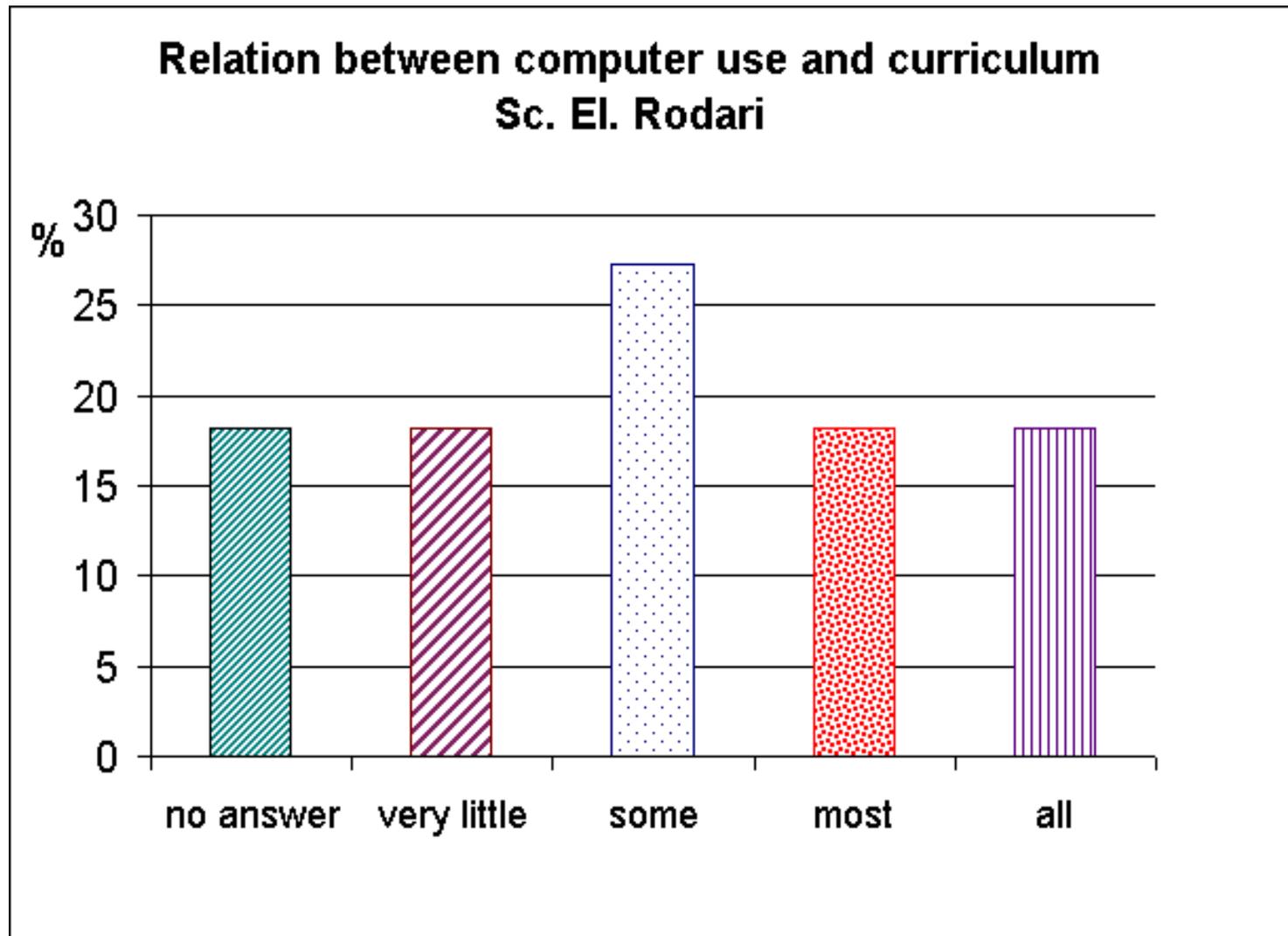
**Figure 5:** Per cent distribution of the answers to question 21 about the importance of computer use at the moment of students assessment. (Was student computer use ever evaluated for grading? Yes – No).



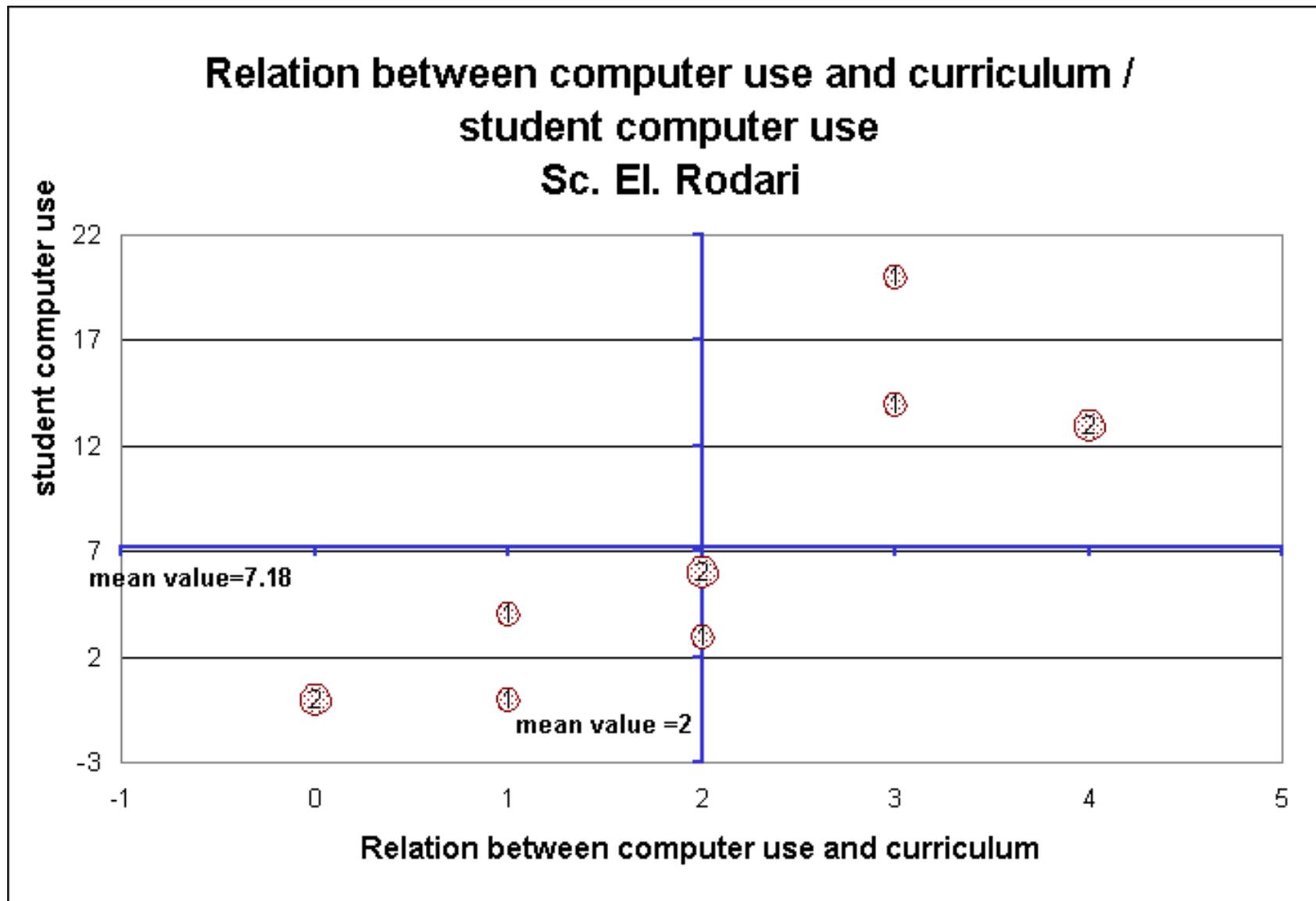
**Figure 6:** Comparison between ICT applications suggested to students in class (questions 9-19) and the computer work assessment in giving marks (question 21). On abscissa, 0 means lack of evaluation and 1 means evaluation. The sum of scores concerning the uses of computer suggested to students is on ordinate; their values range from 0 = never or no answer to 3 = many times per week.



**Figure 7:** 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.



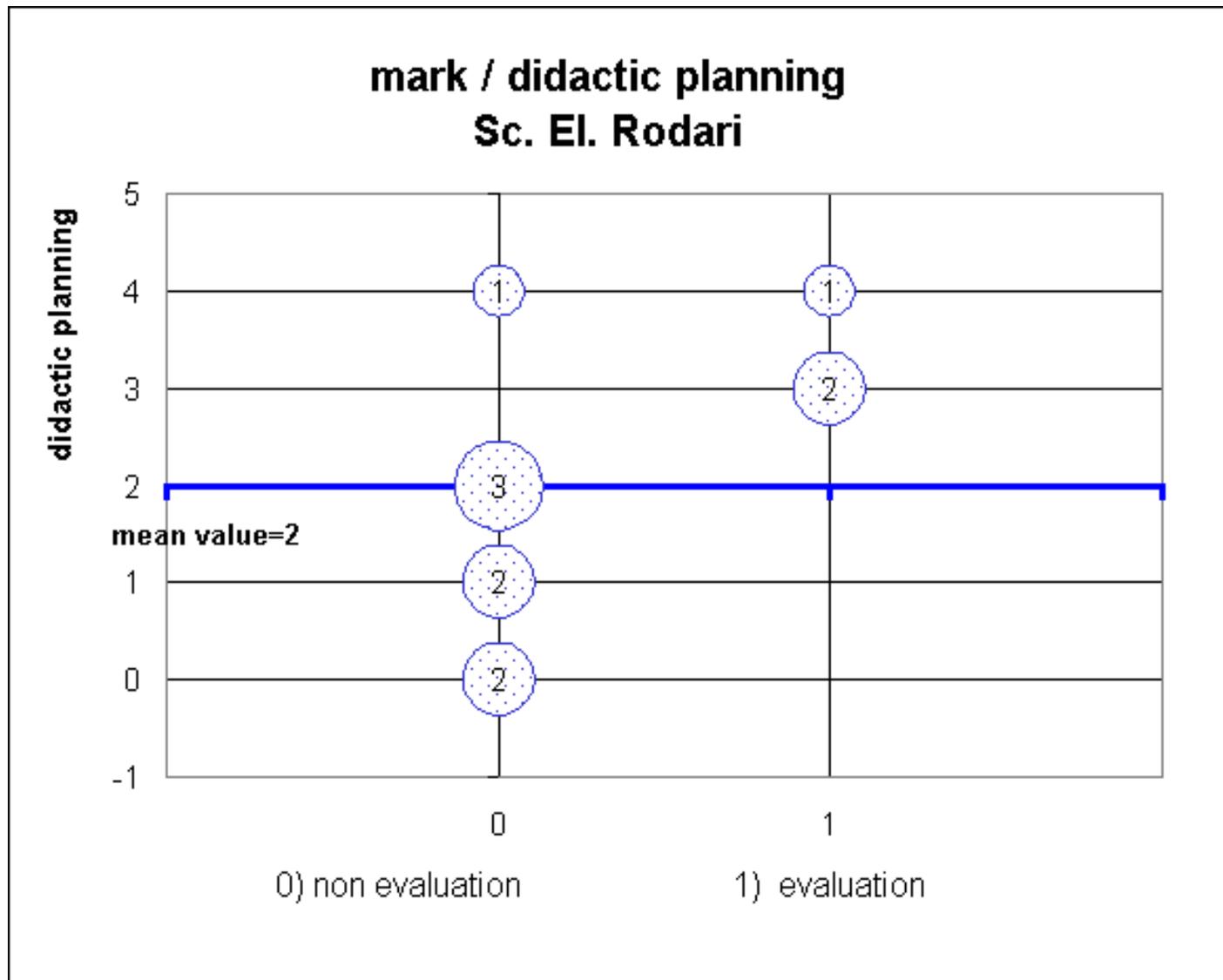
**Figure 8:** Per cent distribution of the answers to question 24: at what extent computer use is directly related to the didactic planning (what portion of the computer use in your classes was directly related to the course content): all, most, some, very little.



**Figure 9:** 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.

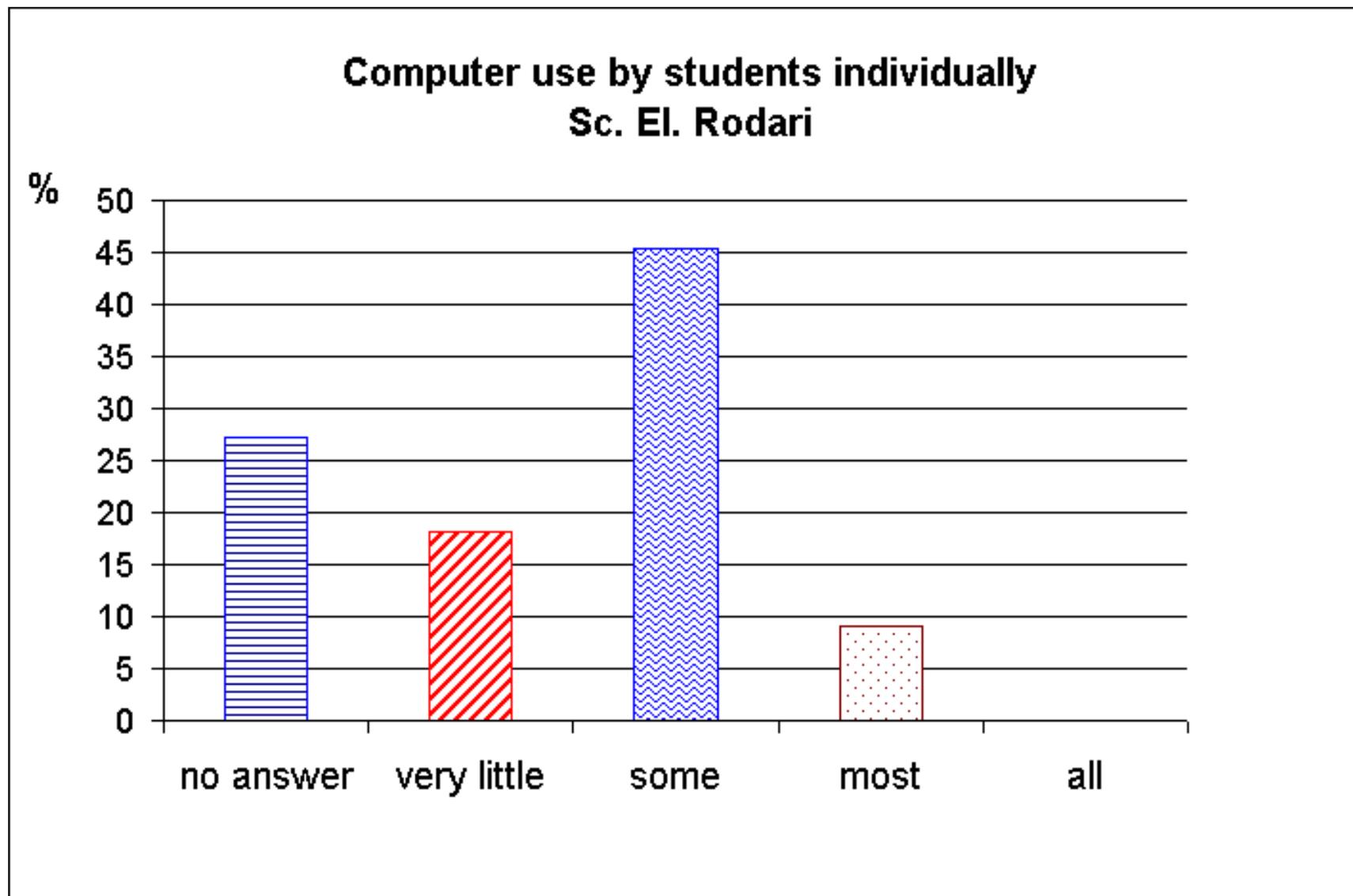
The points are mainly arranged in the first and third quadrants thus suggesting a positive correlation between ICT integration in curriculum and

variety of the uses proposed to students in class. The absence of points in the second quadrant is probably due to the fact that the school pupils are little and the use of computer is always suggested and guided by teachers.

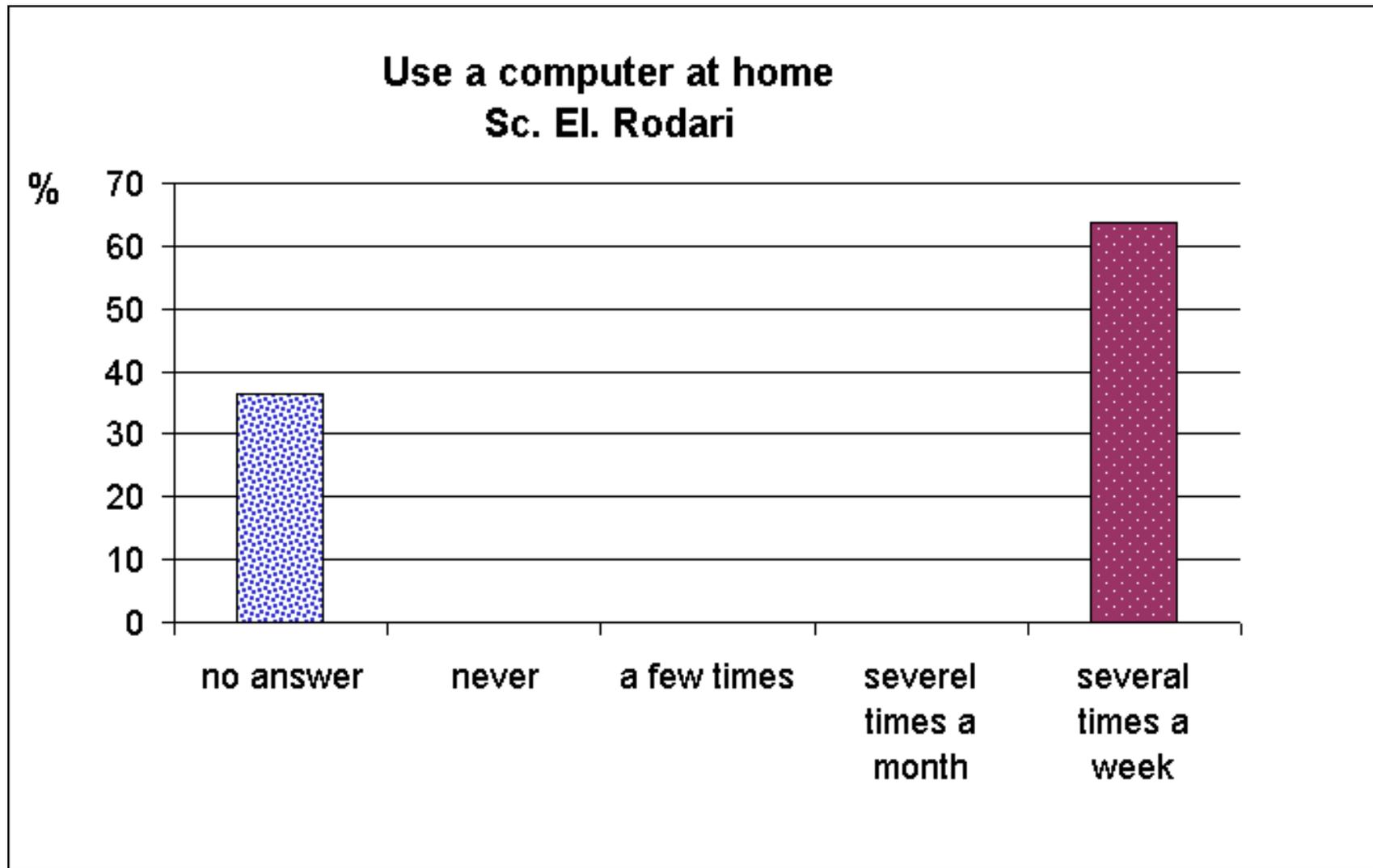


**Figure 10:** Comparison between computer use assessment in the assignment of marks (question 21) and link between computer use and didactic planning (question 24). The presence or absence of assessment are shown on abscissa (yes/no = 1/0), while on ordinate the values range from 0 = no answer, 1 = 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. As we have already seen in Figure 6, the higher number of values corresponds to an

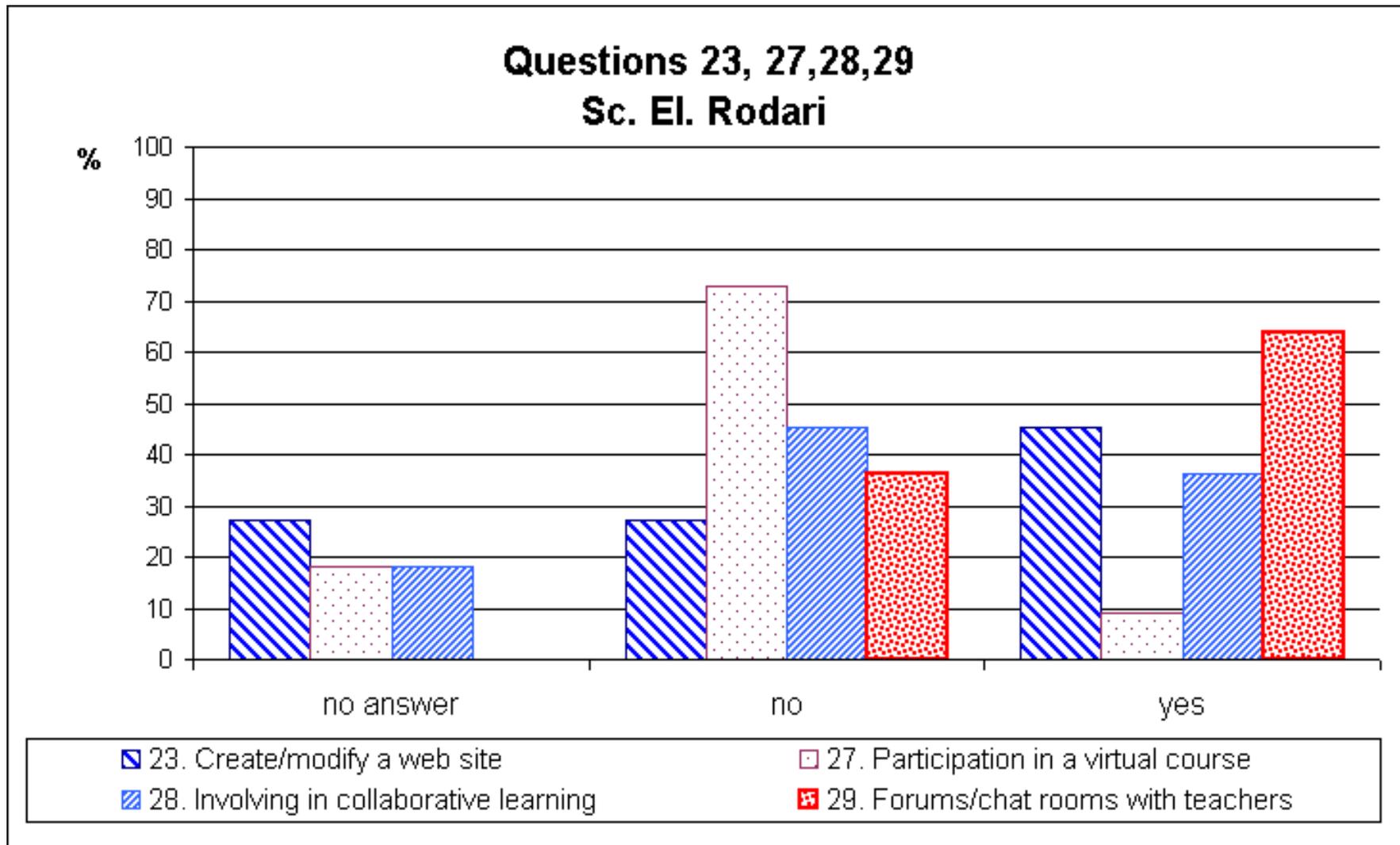
absence of computer use assessment. This could mean that information technology is not a teaching subject but only one of its tools.



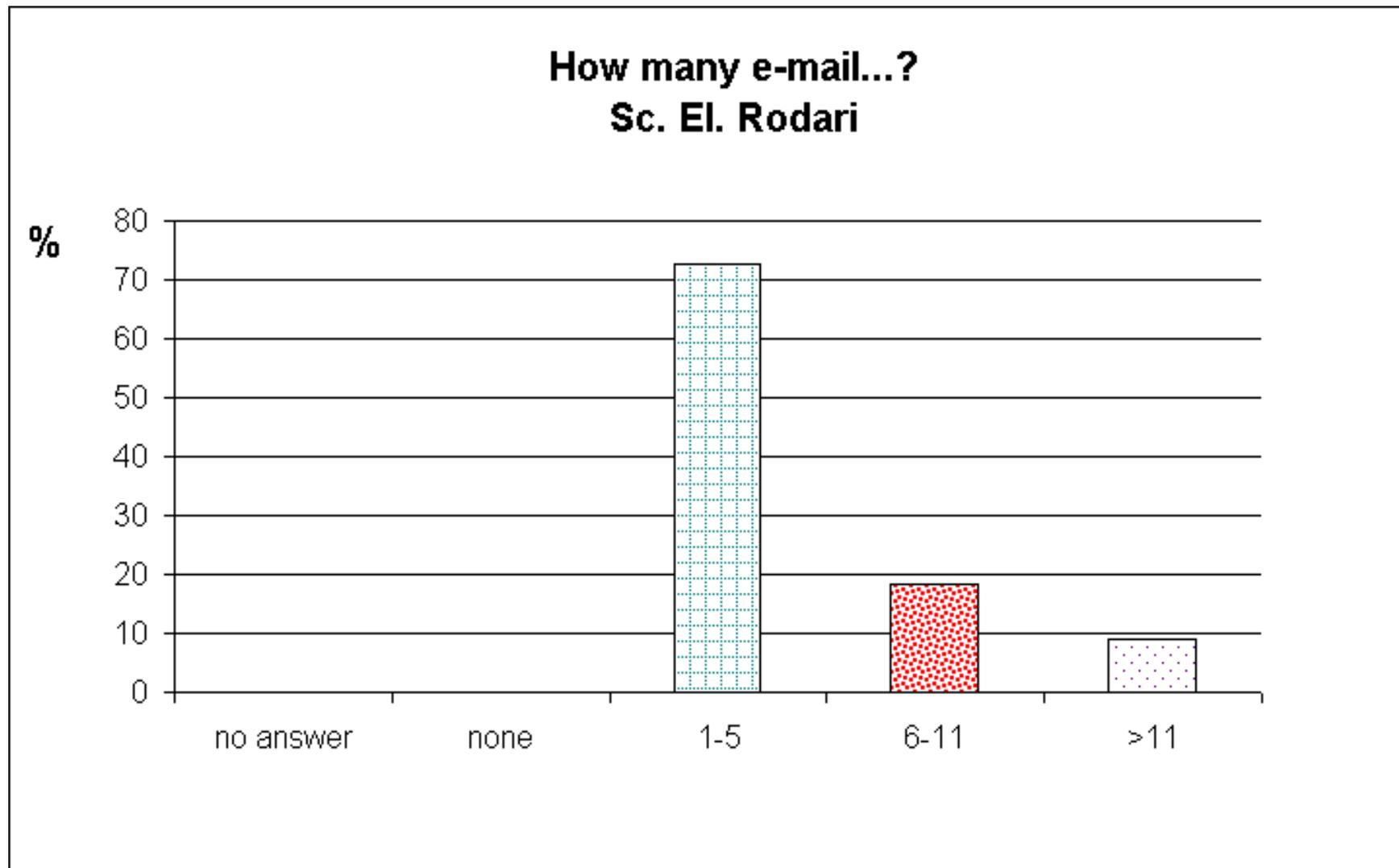
**Figure 11:** Per cent distribution of the answers to question 25 concerning the individual computer use by students in the class (what portion of the computer use that you assigned was done by students individually?): all, most, some, very little.



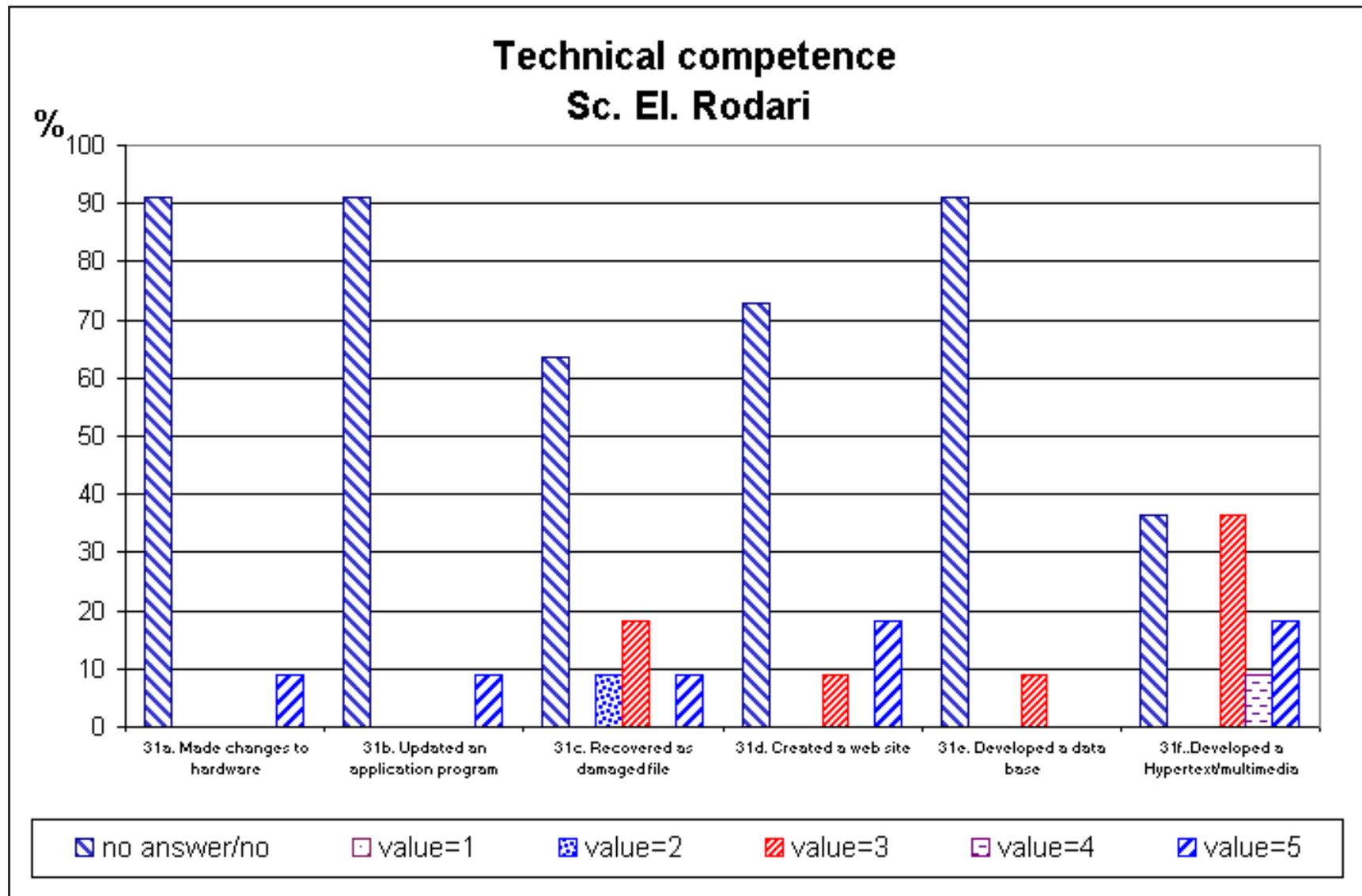
**Figure 12:** Per cent distribution of the answers to question 26 concerning the teachers' computer use at home to prepare their lessons (how often did you use a computer at home for preparing for teaching?). Only two alternatives are possible; even on the basis of the interviews, the absence of response was interpreted as corresponding to the fact that many teachers complained of not having a computer at home, while those who have a computer, have bought it to work better at school.



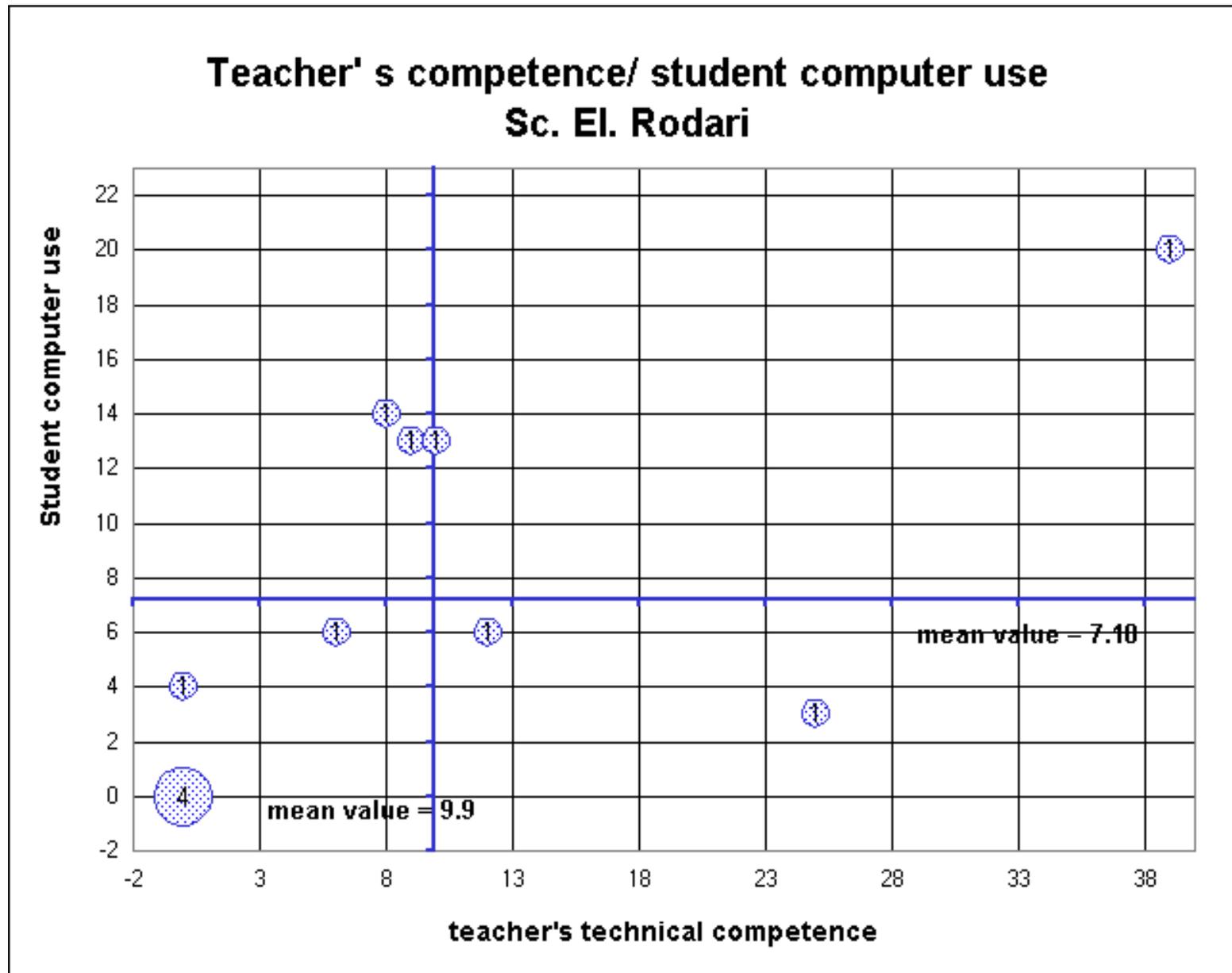
**Figure 13:** Per cent distribution of the answers to the question about ICT activities by teachers within their professional training courses (question 27 and 29) or about their work with the classes (questions 23, 28).



**Figure 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).



**Figure 15:** 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.



**Figure 16:** 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. 15). The answers to questions 31b

("updated an application program – word processor, graphics program, etc."), 31d ("created a web site") and 31f (developed a hypertext, a multimedia with your class", a special question added by the Italian research group) have a double weight. As a whole, the questionnaire answers are few (though corresponding to 41% of the school teachers); the evaluation of this graph is therefore a little ambiguous, even though some characteristics are well recognizable: the point on the left above, completely isolated from the other ones can not correspond to nothing but the answer of the person responsible for ICT whose important role in the school is unanimously recognised.

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## Appendix C

### G. Rodari Primary School – Udine - Italy

Rodari school is fairly known at a national level for the experimentation it carried out. Persons responsible for ICT provided us with a wide press review of the latest articles published. Most of them were published in local newspapers; one of them was issued, on 21<sup>st</sup> May 1995, in the scientific pages of "L'Unità", an important national newspaper; (the article "Online school: the original initiative of teachers and students: the "Formicaio", a BBS born in Udine three years ago" was written by Antonella Marrone).

In 1997-98 the school was the subject of another national research promoted by IBM Italy. The research results, edited by S. Bagnara; F. Butera; A. Failla, are gathered in a book: *Scuole con il computer: professioni e tecnologie nella scuola che cambia (Schools equipped with computers: professions and technologies in the changing school)* Milano, Etas libri, 1998. The research aimed at *identifying successful systemic contexts (i.e. integrated models of objectives, technology, organisation, professionalism) and efficient processes (ways of introduction, diffusion and training which had turned up to be sound) playing a positive role in the efficiency, quality and spreading of the new multimedia technologies* (F. Butera, work quoted).

After three years, the description presented in that research is confirmed: its system of organisation based on the expansion of communication processes and on exchange of knowledge is the heart of the reform taking place at Rodari.

*The school has often supported educational animation activities and projects to promote the use of ICT at school; in particular, Rodari's classes have often been invited to take part in the web school activities. The Telecom division has built a rich reference site, sponsored by the Ministry of Education, for those schools which are active in the ICT didactic use.*

[The school site](#) contains plenty of materials about projects (both in progress and carried out), initiatives and the school everyday life. From the site it is possible to download the "Piano dell'Offerta Formativa" (Training Offer Plan) which is nowadays the standard presentation document of all the Italian schools. The [online "POF"](#) is still referred to last year, but it is pointed out that the projects presented are valid for the following year as well.

On the site it is also possible to consult the tabloid, even the back copies, to read the thought of the day and to see the drawing of the day. This site is continually updated (even more times per day and during holidays, too). Little compositions and drawings are put in Intranet directly by children; those ones to be published on the Internet site are then selected by the tabloid editorial staff or the webmaster. A guests' register (immediately before Christmas holidays, that is the first message dates back to December 25<sup>th</sup> 2000) has been recently introduced and is used

even by the school children to send their messages from home.

The most pleasant site section is the net poll one: periodically, children are requested to vote about different subjects; the format showing the alternatives among which they can choose also offers some space to write short notes about the reason of the choice. More general results and reasons are published at the end of the survey. All the teachers collaborate introducing the net poll even to the youngest children who can not read yet. Thus, lively discussions and forecasts about what turns out to be the most voted one animate the meetings of children belonging to different classes.

Forums and documentation about the projects under way can be seen only through Intranet because they are considered as working tools within the school.

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<sup>1</sup>F. T. Altan is a well-known Italian illustrator and cartoonist, author of many famous characters for childhood publishing and for politic satire.

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<sup>2</sup>Gianni Rodari *Grammatica della fantasia: Introduzione all'arte di inventare storie* (The Grammar of Fantasy: Introduction to the Art of Inventing Stories), Turin, Einaudi 1973.

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<sup>3</sup>A teaching district is a group of compulsory schools, primary and secondary schools, with only one administrative and executive management. Some criteria for rationalising schools' distribution on the territory favoured the gathering of more schools that earlier were independent because they were more numerous. 600 students represent the minimum amount within teaching districts. With the current reform of school system districts will comprise also secondary schools, that is to say until the 7<sup>th</sup> year of compulsory school.

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<sup>4</sup>Friuli region is one of the first few regions with special autonomy in Italy. This is due to the peculiarity of the culture of this border region whose language and tradition are protected even within the development of national integration.

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<sup>5</sup>Lev Semenovich Vygotsky *Pensiero e linguaggio (Thought and speech)*, Florence, Giunti and Barbera, 1976.

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6Mr. Soldini is a famous Italian skipper.

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