

Learning by Playing with e-Tales

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Abstract

This paper looks at the contribution which the cooperative learning method can make in the design of on line learning processes aimed at stimulating an increase in student's reading comprehension abilities and self-efficacy. After describing the theoretical and educational significance of the research, we consider and analyze the main goal and the research method. The present study was carried out with 74 students age 7 and 8. Using pre and post testing tools, we monitored the trend over time of the research variables: the level of self-efficacy and the level of reading comprehension. The review highlights the need for a more extensive and in depth investigation of some problems of the empirical research method. Finally, some proposals are made for the orientation of future research.

Keywords: Virtual collaborative learning, children's self-efficacy, reading comprehension, information and communication technology.

Introduction

Based on the model of Constructivism we propose a kit of learning activities where learners develop their self-esteem through Cooperative Learning. Cooperative Learning is a didactic method in which small groups of students work together to improve the learning of all group members, providing a conceptual, operational and coherent framework of cognitive, motivational, affective and social processes. The fundamental characteristics of this learning method are: positive interdependence, individual and group responsibility, constructive interaction, evaluation, and social skills. The significance of the theoretical method used in our research lies in the operational respect of the theoretical principles that characterize the model itself (Johnson, Johnson & Holubec, 1993; Johnson & Johnson, 1999; Jonassen, 1991; 1995).

Research shows that learning improves noticeably more in situations of cooperation than in competitive or individualistic settings. Cooperative efforts frequently lead to the use of higher reasoning strategies (Kohn, 1988). The Computer Supported Cooperative Learning (Salomon, 1992; Kaye, 1992; Brown & Campione, 1994) helps to make a learning environment more motivating, so that the educational goals are easier attainable. Thanks to the features of cooperative learning environments, the opportunities for group work, interpersonal relationships, self-determination, curiosity and competence increase, thus giving a strong boost to scholastic success and also to self-esteem, self-efficacy and scholastic performance.

In order to equip the students with the tools that will help them develop self-esteem, it is essential to have a better understanding of what self-esteem is. Self-esteem is based on the collection of beliefs or feelings that we have about ourselves. How we define ourselves hugely influences our motivations, attitudes, and behaviors. It's a cognitive-behavioral, multidimensional schema learned during the experiences of our lifespan in several contexts (James, 1983).

Often the concepts of self-esteem and self-efficacy are used with the same meaning. According to Bandura (1997; 2000) the term self-efficacy is referred to a person's belief that he/she can successfully carry out "courses of action required to deal with prospective situations containing many ambiguous, unpredictable, and often stressful elements". Therefore, self-efficacy is a person's belief that people have about behavioral competence in a particular situation. More in detail, according to Harter (1990) self-efficacy refers to a person's judgment about his skills in specific fields of action, while self-esteem is a global concept that regards judgments on his own self-worth.

We hypothesize that when students are involved in cooperative activities such as playing with *e-tales* with the support of Information and Communication Technologies (ICT), they experience a sense of motivation and accomplishment that bolster their developing self-efficacy (Ottaviano, Chifari, Seta, Ascolillo, 2004). Mastering learning goals teaches a young child a "*can do*" attitude, so that the concept of success following persistence starts early.

It is interesting to investigate whether a cooperative working environment modifies a student's perception of his self-esteem and self-efficacy and to see whether any such modification is related to an improvement in educational performance. Whether, therefore, high quality didactic activities increase the number of students' successes, so they perceive themselves as having greater control over their scholastic skills and competences (Coleman & Hendry, 1990).

As in a vicious circle, feelings of mistrust and inadequacy decrease because the didactic performance improves and, at the same time, self-efficacy increases (Pajares, 1997; Schunck, 1998; Zimmerman, 1995).

For this purpose an experimental situation was set up to measure variations in the three dimensions (comprehension of a text, self-efficacy and self-esteem) in two groups of students, one performing individual activities and the other working on collaborative activities.

The method

The main goal of the present work was to design and experiment with cooperative online learning activities to improve students' self-efficacy, as a result of their repeated experience of success, and their level of reading comprehension.

Sample

The research involved four classes from two primary schools "T. C. Onorato" of Sferacavallo and "G. Pascoli" of Partanna, both sites in Palermo, Italy. In total the sample consisted of 74 students (35 girls and 39 boys), ages 8 - 9 years old. Students were subdivided into two groups,

an experimental and a control group. The first constituted by *remote* groups of two or four students; the second by dyads or singles *off line*. Both of them worked on the same activities with specific roles.

Tools

The tools used for the pre and post testing are:

- a. The scale of school achievement, taken from Bracken's TMA Multidimensional Self-Concept Test (Bracken, 1992).
- b. The ASCP scale to evaluate Children's Perceived Self-efficacy, taken from a study by Caprara (2000).
- c. The comprehension test taken from MT-Reading Tests n° 2 for primary schools elaborated by Cornoldi and the MTGroup (1981).
- d. The Internet, to collect information and to permit the communication between students in remote locations. In particular, they used the software Microsoft NetMeeting to chat and to share resources.

Procedure

The research design was ABA': phase A was the *baseline* phase in which the students' levels of perceived self-efficacy and reading comprehension were assessed using the above mentioned tools; phase B was the *training* phase in which the students carried out cooperative study activities with the support of Information and Communication Technologies (ICT). Finally, phase A' was the *re-testing* phase aimed to measure the full, partial or non-achievement of established research goals.

With particular regard to phase B, two preliminary steps preceded it: clarification of the aim of the activity was given to each pair and the main functionalities of NetMeeting such as chat, file sharing and blackboard sharing were explained; the time and roles for each activities were assigned.

Table 1 specifies the activities for improving self-esteem and Table 2 the reading comprehension activities. The time, role and tool are also indicated for each of them.

Table 1. Activities to improve self-esteem

Self-esteem Activities	Time	Roles	Tools
Read the tale	15'	Independent readers	Power Point
Identify protagonist's emotions	15'	2 writers, 2 highlighters (one for each school in turns)	NetMeeting: chat, sharing
Identify their own emotions	15'	2 writers, 2 highlighters (one for each school in turns)	NetMeeting: chat, sharing

Table 2. Activities to improve reading comprehension

Reading Comprehension Activities	Time	Roles	Tools
Read the tale	15'	4 Independent readers	Power Point
Take tale to pieces "1". Identifying protagonist, characters, and site.	15'	2 writers, 2 highlighters (one for each school in turns)	NetMeeting: chat, sharing
Take tale to pieces "2". Identifying plots, problems, solutions.	15'	2 writers, 2 highlighters (one for each school in turns)	NetMeeting: chat, sharing
Find positive consequence	5'	2 writers, 2 highlighters (one for each school in turns)	NetMeeting: chat, sharing
Find first and second solution	10'	4 writers (one for each school in turns)	NetMeeting: chat, sharing
Draw moral from the tale	10'	4 writers (one pair writes the moral in chat, the other pair writes the moral in a file)	NetMeeting: chat, sharing

The activities of this training phase were based on the comprehension of a fable, entitled "Julia the fox", dealing with topics which are fundamental to a child's growth (facing scholastic assignments, self esteem, etc.).

The goal of this tale is to understand problems and find alternative ways to face and solve problems. Initially, the main character of the tale has negative thoughts and disturbed emotions causing unsuitable behavior. As the tale progresses, thanks to the help of other characters, Julia the fox modifies her outlook, emotions and behavior in search of positive solutions. In the end she learns that inappropriate behavior doesn't necessarily produce an inept person.

Following our procedure, all the students read the tale, as reproduced below, before starting the cooperative online activities. An original and user-friendly PowerPoint file to allow students to re-construct the pieces of the tale implemented the activity centered on the fable "Julia the fox".

"Foxes are cunning animals. They manage to avoid dangers, such as traps set by men, and they are good at hunting. However, Julia was a small fox who lived in the wood and although she had begun attending the hunting school, she wasn't considered to be a very wily fox. This was because during the exercises, instead of concentrating on the animal she was supposed to be hunting, Julia was easily distracted by the scent of a flower, the noise made by a mole underground or the singing of little birds.

So the small fox was always behind the other foxes and she had bad marks for her exercises.

Julia said to herself, "Foxes are smart animals but I'm not because I can't concentrate and I'm stupid. My marks are so bad and I'm no good at anything."

The fox wandered about aimlessly until she met a mole.

"Hey fox!", the mole said.

"Don't call me a fox, because I'm not worthy of the name, just call me Julia.

"I'll call you whatever you want," the mole answered, "but you'll always be a fox, whatever happens and whatever you've done."

"I can't do the things which a fox usually does", replied Julia and she told her story, "I'm not smart, I'm not good at anything, I make a lot of mistakes and I get bad marks at school. I don't just do one thing wrong, I do everything wrong."

"I don't think you're a stupid fox or not very smart just because you're sometimes distracted. I think you're an inquisitive fox and that's why you're a bit distracted," the mole answered.

"Excuse me, but what should I think about myself then?", the little fox asked.

"To start with, you could love yourself more, and remember that you are always you. You are Julia the fox, even when you do something badly, or when you are criticised, or when you get bad marks at school.

"Think of three good things that you've done lately," the mole told her.

Julia thought about this and then she said:

"I got away from a hunter.

I had a lovely day in the sun.

I helped my dad to clean the den."

The mole added, "You see, you don't just do bad things, you've also done a lot of good things. You should learn to accept yourself as you are. We all do good things and bad things. And just as you've done good things in the past, you'll also do them in the future."

"I like what you say and I think that it's useful, but what can I do to make as few mistakes as possible?"

"Remember that nobody's perfect, we can all make mistakes. Do you know anyone who is never wrong? Mistakes don't change what's good about a person: you learn by your mistakes! Mistakes help us to learn", the mole said.

"Well then," exclaimed Julia happily, "My mistakes have been a lesson to me and I will accept them as an example." And she made her resolutions: I'll accept myself as I am, I'm not stupid, I'm clever and skilful. I am Julia the fox, whatever good things or bad things I do. I'm responsible for my mistakes.

It is true, I committed some mistakes. I will try to do better and I will learn to hunt."

The fox felt reassured by the mole's words, but she didn't know if she would be able to put them into practice. Would she manage to improve, not to get discouraged and to feel special anyway? She wasn't sure about it, but she would try.

When Julia was on her way home she heard some men's voices. They were laying traps all over the wood.

"There's no time to lose!" she thought. "I must warn the whole community of foxes!"

She ran as fast as she could and the moment she got home she warned her parents about the danger of the traps.

"I haven't got time to explain now", the fox said, "but we must warn all the foxes and hide from the hunters».

So it was that thanks to Julia all the foxes in the wood escaped from the dangers of the traps.

Afterwards Julia was no longer considered to be a fox who wasn't cunning but a fox who had done something very useful at a critical time.

"I am really lucky to have met the mole," thought the fox. From now on I'll be able to remember what she told me when I'm by myself. It is important to accept myself as I am, with all my faults and my good qualities, with the good things and the bad.

I must accept my mistakes without getting discouraged and try to do things better." (Verità, 2002).

In particular, during the first cooperative study session, students had precise goals to pursue, such as analyzing the characters, plot, problems and solutions, and extracting the moral from a tale (fig.1).

In this phase students in the experimental group carried out some interactive tasks, using chat, to come to an agreement about:

- The setting in which the tale took place, highlighting it in blue
- The name of the main character of the tale, circling it in red
- The other characters in the tale, circling them in green. Then they copied and pasted the names of the main character and supporting characters onto the "Character slide"
- The phrase that describes the opening of the tale, underlining it in light blue
- The phrase that describes the body of the tale, underlining it in yellow. Then they copied and pasted both phrases into the "Plot slide".

Figure 1 represents the slide used to introduce the activities listed above: each word is a link to the related slides.

At the end of this first work session, students had to find the phrases that describe the right things that Julia the fox learned, underline them, and then write the moral of the tale in the appropriate slide (fig.2).

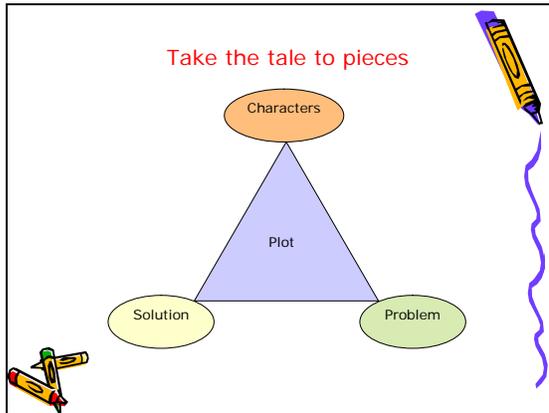


Figure 1. Introducing the activities

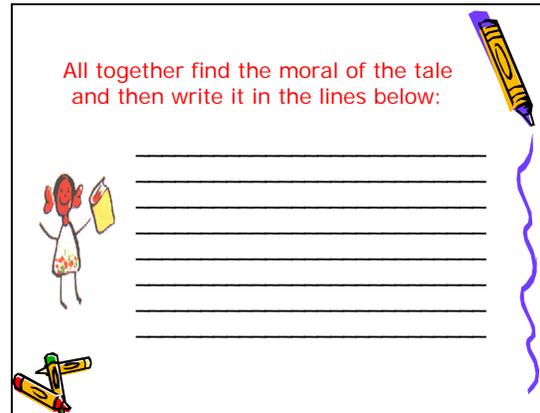


Figure 2. Moral of the tale slide

When the analysis phase was finished, the students were involved in cooperative activities implemented *ad hoc* to encourage comparison and opinion sharing to find alternative solutions to Julia's problem (fig. 3) and recognize her emotions (fig. 4).

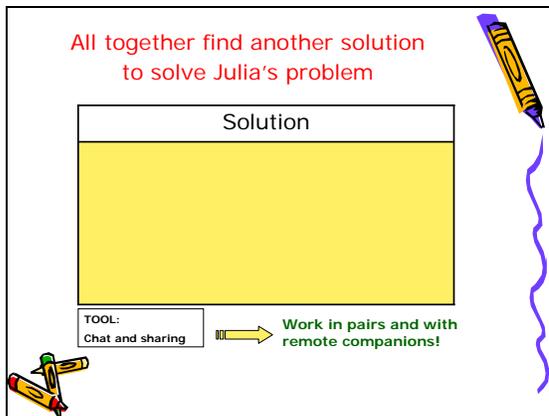


Figure 3. Solutions slide

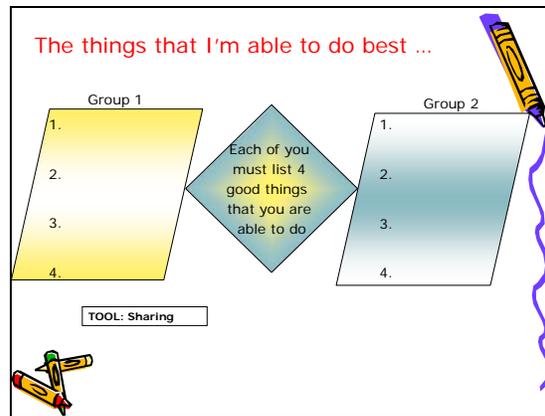


Figure 4. Emotions slide

Besides, the students were involved in activities aimed at making some personal considerations and confronting their individual opinions with the others by sharing tools, as shown below.

Julia's emotions ...

1. _____

2. _____

3. _____

Choose 3 expressions which in your opinion describe Julia's emotions and put them in the order in which she experienced them.

Drag the chosen expression next to the corresponding number.

Group 1 = yellow figures
Group 2 = light blue figures

TOOL: Sharing

Figure 5. Julia's emotions slide

Now list things which you do best which you have in common:

1. _____

2. _____

3. _____

4. _____

TOOL: Sharing

Figure 6. Things you excel slide

Finally, thanks to the closing activity (fig. 7, 8), the students used inference to cooperatively identify the most important factor for well being at school and the most effective way for solving problematic situations. Our goal was to stimulate the generalization process or rather the transfer of competencies from the context of the tale to the school setting.

Discuss and compare ...

What is the most important thing for well being at school?

TOOL: Chat

Figure 7. Most important thing slide

Discuss and compare ...

What have you learned from this experience?

TOOL: Chat

Figure 8. Learning outcome slide

The same activities were assigned to the control group but without the use of chat and file sharing.

Statistical Analysis

We perform an explorative statistical analysis of data to verify if:

- A relevant difference exists in the score distributions between the control and experimental groups, in some examined dimension;
- Some correlation exists between self-efficacy, self-esteem and didactic performance, regarding reading comprehension.

We summarize the results of the three re-tests for the Control Group (CG) and the Experimental Group (EG) in figures 9 and 10. The graphs show a positive correlation between ASCP and TMA results; the correlation found in the CG is stronger than the one in the EG, and both are statistically significant at 1% level. The MT results don't appear correlated with the other two dimensions. These considerations do not support the hypothesis that the self-esteem increases, as a consequence of an improvement in the didactic performances.

In the following, we analyze the results obtained in the various tests to underline the differences between CG and EG in each dimension.

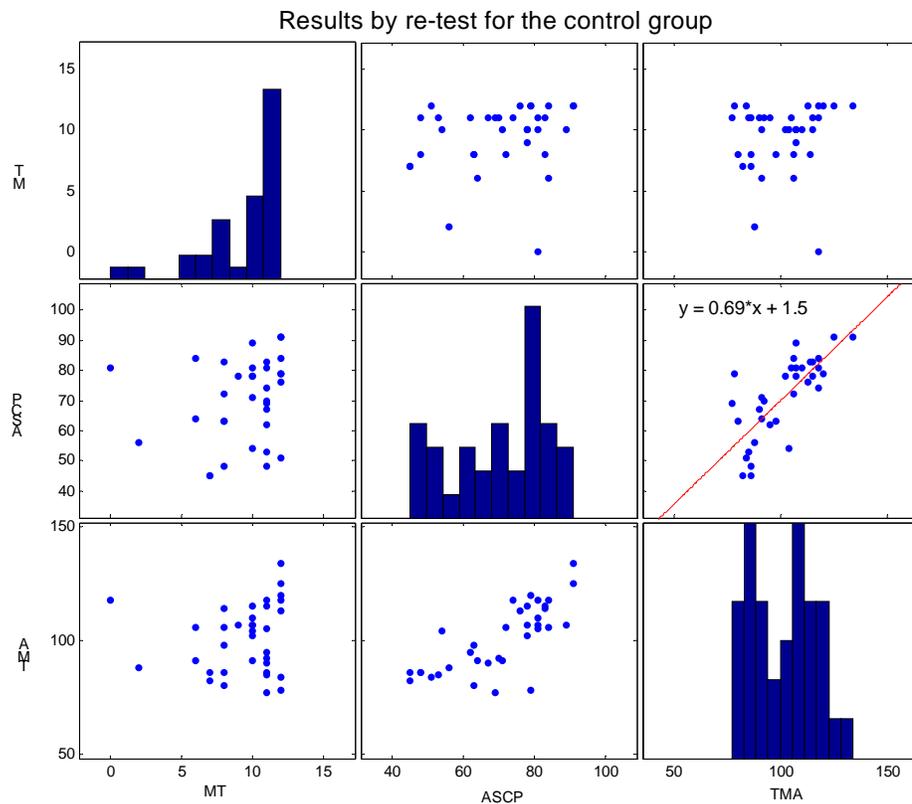


Figure 9. Control group scores

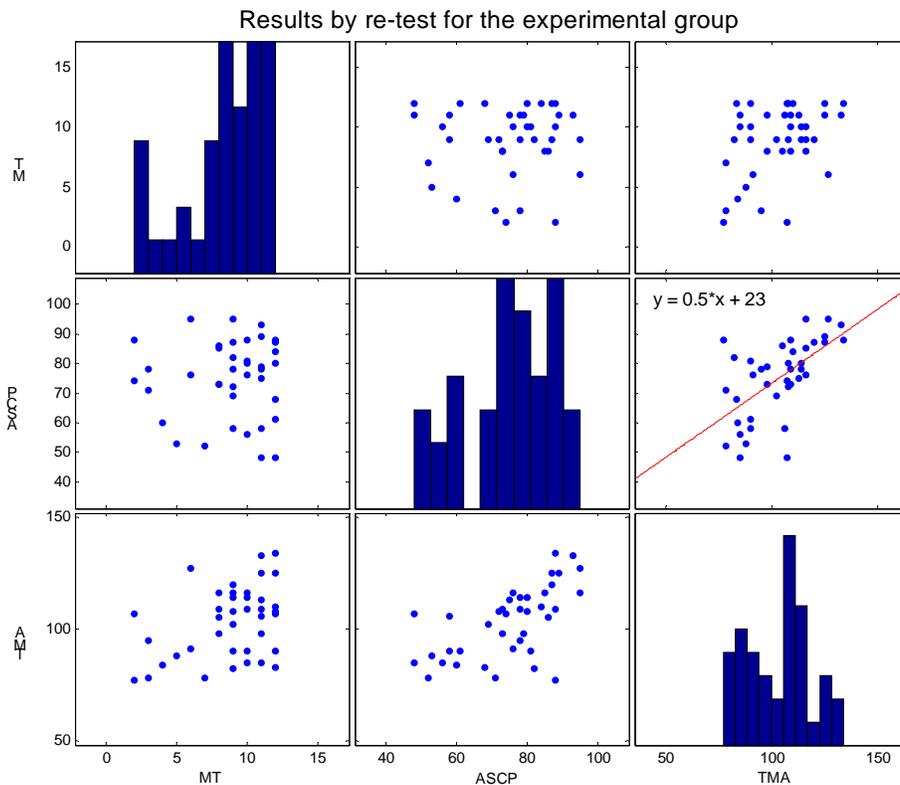


Figure 10. Experimental group scores

TMA results

As a first step in the analysis, we verified that the samples came from a normally distributed population. We applied a Kolmogorov-Smirnov Test to verify the null hypothesis that the values came from a normal distribution with mean = 100 and variance = 15. The results of the test do not allow us to reject this hypothesis for the four series of data. We had fixed the significance for rejecting the null hypothesis at the 5% level.

We note that the mean values slightly decrease (102.9 in the test, 100.9 in the re-test) in the CG, where they slightly increase in the EG, (from 101.4 to 103.2), but such differences are not statistically significant.

To compare the test and re-test results of the CG and EG we have estimated the probability density (Fig. 11). In particular the distribution of the scores for the students in the CG is stable. In the EG, that had an average level of self-efficacy, the scores are now distributed toward the “higher” or “lower” levels. These considerations highlight that, aside from the experimental activity, didactic activities have an influence on the level of self-efficacy and the cooperative based activity tends to separate the sample into two more distinct classes.

These results are not conclusive. Using Student's "t Test" we verified that there is not significant difference at the 5% level between the results to the TMA test and the re-test of the EG. The same is true for the control group.

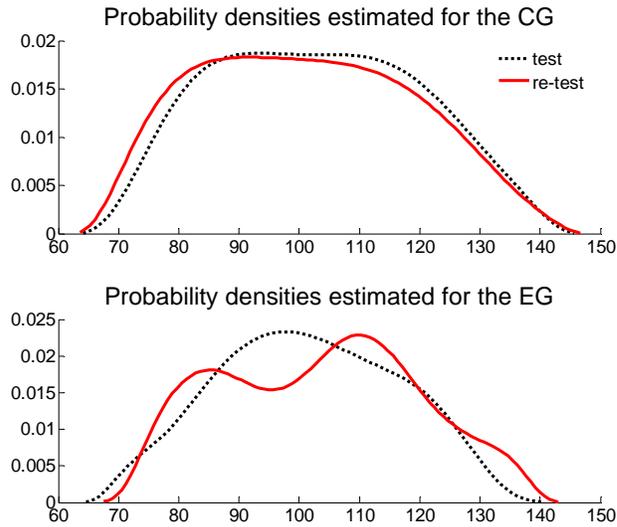


Figure 11. Probability densities estimated

ASCP results

In this case, the population distribution is unknown, so we applied the non-parametric test of Wilcoxon "Sum of the ranks" to evaluate whether the two groups are drawn from the same population. The results of the test, at 5% significance level, don't exclude this hypothesis.

Also in this case we don't have significant differences in the mean values; in particular we note a slight decrement for the CG (from 72.8 to 70.6) and a constant value for the EG (74.7 for the test and 74.9 for the re-test). We limit ourselves, therefore, to evaluate the distribution for bands of scores. In general, comparing test and re-test data for the EG, we note an increase in the values corresponding to the medium, "very low" and "very high" bands but a decrement in the "high" and "low" values. It emerges that a decrement of the middle scores corresponds to an increase in "very low" scores and a decrement of the "very high" scores (Fig. 12). This pattern is different for the CG where the middle scores don't show strong variations in frequency (Figure 12). This analysis agrees with the results of the TMA test and suggests that the computer based activity divides the sample population into more distinct classes.

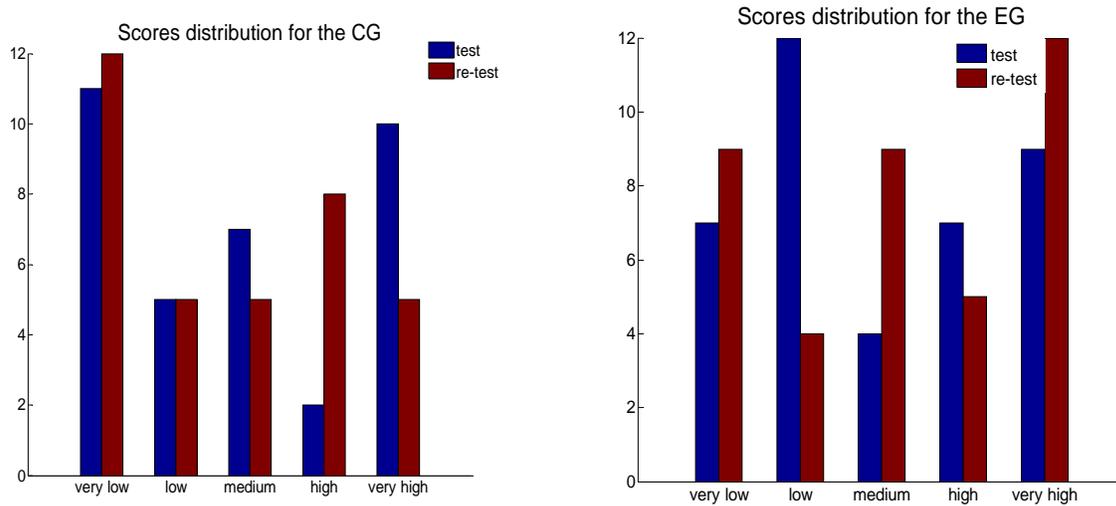


Figure 12. The ASCP scores distributions

MT results

Also in this case we consider the distribution for bands of the scores ("Good", "Sufficient", "Insufficient", "Poor"). The data suggests a decrement in the performance for the EG, probably explained by the fact that the online didactic activities are more complex than traditional ones. It may also be possible because the use of ICT allows for the individualization of didactic activities. This reveals difficulties in comprehension that were not previously evident.

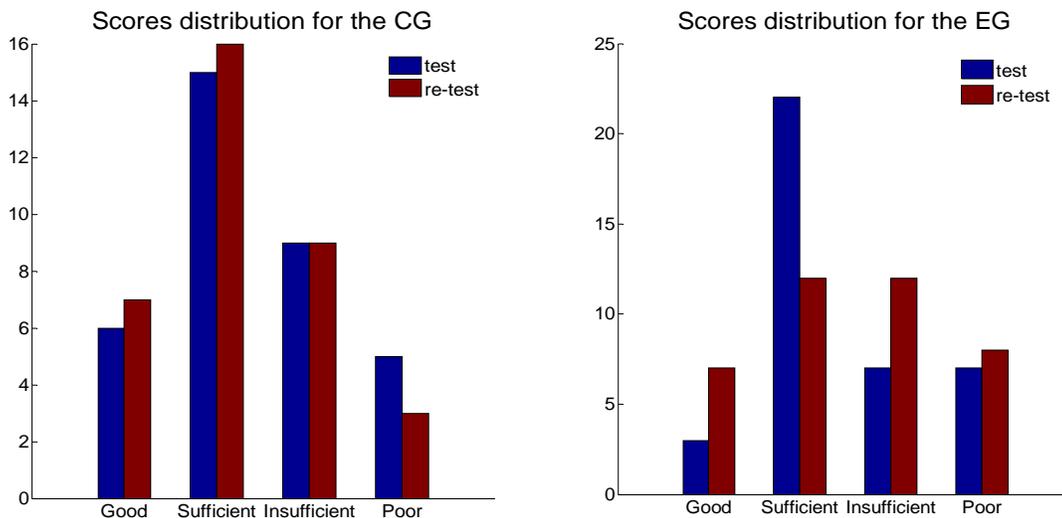


Figure 13. The MT scores distributions

Discussion

Our analysis led us to the following conclusions:

- There is a good correlation between the results of the TMA test and ASCP test. In the EG we observed a slight increment in the scores obtained during the re-test. This leads us to believe that the computer-based activity may be effective for the students with low and high scores during the test.
- There is no correlation with the results of the MT test; for the students in the EG we obtained a decrement in the overall didactic performance.

We note that our results are inconclusive. More studies have to be performed and data for individual performances has to be analyzed to better understand the effect of the computer-based activity.

Conclusions

Our work shows that self-esteem increases, on average, through the use of online cooperative activities, and the population has a greater distribution with high level scores.

Moreover these activities have allowed us to appreciate difficulties that had not been noticed in traditional activities. In our opinion, in fact, this experience highlights one of the most important potentialities of ICT, namely the possibility of putting into practice the concept of individualized learning. In the new set up, in which students have specific roles and specific tasks to perform, the students' difficulties can be carefully assessed and considered. The teacher's attention can be focused, in a step-by-step way, on the work of each dyad. In this way the teacher can plan suitable corrective paths.

It does not surprise us, therefore, that the data distribution does not show a normal increment but rather dispersion towards the extremes (Figs. 11, 12, 13). On the one hand, this may indicate a *decalage* of students' performances; on the other hand, it could be the result of a particular situation involving numerous variables such as learning about a tool's functionalities, the rules of the cooperative method, and the comprehension of the meaning of the tale. These considerations need to be stressed in future work and some aspects of the research design should be better balanced.

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