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## **The Dynamics of Digital Groups: Cooperative Learning in IT-Based Language Instruction**

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### **Introduction**

*I used to think that technology could help education. I've probably spearheaded giving away more computer equipment to schools than anybody else on the planet. But I've had to come to the inevitable conclusion that the problem is not one that technology can hope to solve. What's wrong with education cannot be fixed with technology. No amount of technology will make a dent.* --Steve Jobs, co-founder of Apple Computer (Wolf, 1996)

Do you agree with this quote? We feel that technology, such as computers, can help language education but only if used properly. Schools cannot just give students computers and expect that most of them will learn well. Instead, IT can only deliver its potential benefits when integrated with good content and good pedagogy. In this article, we discuss ideas for how to enhance the effectiveness of IT (Information Technology) via the use of group activities, in particular the use of cooperative learning (CL).

We begin the article with a brief discussion of why groups are recommended in language teaching. After that, we describe what CL is. Then, we suggest ways in which CL and IT fit well together. This is followed by some examples of how to combine CL with IT.

### **Why Groups Are Recommended in Language Teaching**

Many curriculum documents, including those in Singapore (e.g., Curriculum Planning Division, 1991), now advocate group activities, and many coursebooks, including many in Singapore (e.g., Curriculum Development Institute of Singapore, 1995), now include such activities. For example, an informal survey of an English coursebook written for fifth-year primary school students in Singapore (Curriculum Development Institute of Singapore, 1995) showed that of the 43 activities in the book, 23 seemed to be written with at least the option of being done in groups (Jacobs, 1997).

Group activities have become popular because they fit well with Communicative Language Teaching (Richards & Rodgers, 1986) and other trends in language education, such as task-based teaching and an emphasis on interaction (Long & Porter, 1985; Swain, 1993). Among the many benefits proposed for group activities are:

1. Increased student language production
2. Greater variety of language functions in student language production

3. Lower anxiety
4. More individualization of instruction
5. Higher motivation.
6. Greater enjoyment
7. Increased independence
8. Opportunities to learn to collaborate
9. Enhanced learning

### **What CL Is**

Cooperative learning can be defined as a diverse body of concepts and techniques for enhancing the benefits of group activities. CL represents many years of research, theorizing, and practical efforts toward understanding how to improve group functioning in educational contexts (Johnson, et al., 1993; Slavin, 1990). Characteristics that are often seen as critical to CL are:

1. Positive interdependence - the feeling among group members that by helping other group members, they are helping themselves. If students feel they are positively interdependent with their groupmates, they are more likely to stay on task and to help one another learn. However, if teachers do not give careful thought before putting students in groups, group members may not feel positively interdependent with one another. Instead, negative interdependence or no interdependence may exist among students. When students feel they are negatively interdependent, what helps one group member is seen as hurting others and what hurts one is viewed as helping the others. Negative interdependence encourages competition. No interdependence exists when what happens to one group member is not perceived as affecting the others. No interdependence encourages an individualistic attitude.
2. Individual accountability - the feeling that all group members are responsible for participating in and learning from the activity. If students feel individually accountable, they are more likely to try to learn, rather than letting others do the work and the learning for them. However, if teachers just put students in groups without careful thought, one or two group members may end up doing all the work and all the learning.
3. Collaborative skills - the development among students of the skills they need to work with others. With appropriate skills, students know how to help one another, how to disagree constructively, etc. However, if teachers just put students in groups without careful thought on how to help them develop collaborative skills, activities may fail.
4. Classroom management - the use of groups requires careful thought and new procedures for coordinating student learning. Examples of classroom management issues which arise in CL are: how to seat students; the size, composition, and duration of groups; getting students' attention while they are working in groups; and keeping the noise at a reasonable level.

Now that we have discussed some of the key aspects of CL, we attempt to describe CL by considering what CL is not. We have organized this into 9 Notes of CL which are listed and discussed below.

## 9 notes of cooperative learning

1. Not New
2. Not All The Time
3. Not Magic
4. Not Usually by Itself
5. Not in Isolation
6. Not Easy for teachers as for teach trainers
7. Not Simple
8. Not All at Once
9. Not Mainly about Groups

1. **Not new** - CL has been around for more than a generation, and its roots go back more than a century.

2. **Not all the time** - No one advocates that students work in groups during every lesson of every day. CL should be combined with teacher-fronted instruction, individual work, and other modes of pedagogy.

3. **Not magic** - Although the research indicates often superior results on a range of variables when CL is used, CL must be combined with other aspects of good teaching/learning in order to succeed.

4. **Not usually by itself** - CL combines well with other modes of teaching. For instance, a lesson can start with a presentation by the teacher, be followed by cooperative group work monitored by the teacher, and end with an activity which students do alone.

5. **Not in isolation** - CL works best when there is an overall culture of cooperation in the classroom, school, and beyond.

6. **Not as easy for teachers as for teacher educators** - At courses/workshops/presentations you might attend on CL, teacher educators are working with a room full of teachers. Teachers make great students. Students do not always make great students.

7. **Not simple** - There is a lot to learn about CL because group activities are more complicated than teaching via the teacher-fronted mode, as the dynamics of group interaction introduce many new variables to consider.

8. **Not all at once** - CL is a big change for teachers and for students. Everyone needs a chance to adjust. Thus, it may often be best to introduce CL gradually and slowly, although it should be said that some educationists urge more of a "great leap" approach in which CL is used on a large scale from the time of its introduction.

9. **Not mainly about groups** - The ultimate goal in CL is seldom the product a group is creating or the answer a group is trying to develop. These are merely means toward achieving other, more important goals. These ultimate goals of CL focus on the individual, not the group. When evaluating the success of CL, short-term goals such as the correctness of a group's response should be downgraded. Instead, the questions to ask are: Did all the individuals in the group learn new knowledge and skills? Did they all increase their ability and desire to collaborate with others?

### **The many ways computers and CL fit together**

As mentioned above, CL provides us with ideas for helping group activities to be more successful. Now that we have reviewed why groups aid language learning, let us get to our main topic: why and how to combine computers with CL.

#### Why combine computers and CL

1. Computers can isolate students. CL brings them together (Watson, 1990-1991).
2. Computers can transmit large amounts of information to students in a variety of interesting, multi-media ways. Thus, the burden on teachers to lecture is reduced. Instead, more time can be devoted to teachers facilitating CL activities in which students use and explore information.
3. All the same reasons that CL promotes learning in regular lessons apply equally to IT-based lessons.
4. Just as CL facilitates learning with computers, so too do computers provide many ways for students to collaborate with their groupmates, classmates, and others (Crook, 1994; Galegher, et al., 1990; Kolodner, 1993/1994; McDonald, 1989; Smith, 1994).

#### How to combine computers and CL

1. Collaboration can take place at four points in computer use:
  - a. before working at the computer
  - b. while using the computer
  - c. during a pause in computer use
  - d. after using the computer
2. The same key concepts for use of CL without computers apply to CL with computers:
  - a. positive interdependence
  - b. individual accountability

- c. collaborative skills
- d. classroom management

One means of promoting positive interdependence is to give each group member a role. Here are some of roles specific to IT environments (Johnson & Johnson, 1985).

**Keyboarder** Executes group's decisions using the keyboard

**Navigator** Finds and explores resources available via IT

**Mouse Captain** Executes group's decisions using the mouse

**Hardware Handler** Makes sure hardware is set up and working properly

The roles below are general CL roles which are applicable to IT environments.

**Checker** Sees if all group members can demonstrate understanding of the material studied, the process used to study it, and the group's decisions

**Encourager** Prompts all group members to contribute to the group's effort

**Praiser** Congratulates individual members and the group as a whole on their work

**Questioner** Asks questions of individual members and the group as a whole

**Coordinator** Organizes the group's effort

**Recorder** Notes down information from group decisions and processes and/or from the computer

**Reporter** Reports group's decisions and work to others, using visuals, multi-media, and/or a class-size voice

**Materials I/C** Gets and later returns materials, e.g., CD-ROMs, that the group needs

**Noise Monitor** Reminds the group to use 30 centimetre voices

**Time Keeper** Reminds the group of time limits

3. The same CL techniques can be used, but sometimes must be adapted.

4. Many modes of collaboration via computers exist. Some have been transferred to education from Computer-Supported Cooperative Work (CSCW). Some use specific software called groupware. Groupware is "a generic term for many different sorts of electronic tools and types of software, for example, co-authoring tools, group decision support systems, shared data bases, and intelligent information-sharing systems" (Collis & Heeren, 1993: 37).

5. Among the ways for students to collaborate via computers are:

- a. Brainstorming and planning before computer use
- b. A group of students at the same computer, e.g., one has the mouse
- c. 4 students - 2 computers. Students divide into pairs, each with their own computer. Each pair does a task, then compare their results.
- d. One student researches or does another task via computer while others do related tasks with other resources
- e. Students discuss while doing a task on the computer
- f. Groups pause in their use of the computer to discuss their progress, learning, and learning process
- g. After working on the computer, groups use other means to continue learning
- h. Email communication

- i. Exchange of diskettes or later use of the same hard drive
- j. Networked computers
- k. Internet discussion lists

6. As Table 1 shows, IT-based collaboration can vary according to whether or not the collaborators are working at the same time and whether or not they are working at the same computer.

*Table 1. Examples of Ways Students Can Collaborate According to Variations in Time and Place\**

	Same Computer/Place	Different Computer/Place
Same Time	Students work together on the same computer	Students work on networked computers; chat groups
Different Time	Group member A works on the computer, while Group member B is working on something else; then, B works on the same computer while A is working on something else	Email; Internet discussion list; exchange of diskettes

\* Please note that some of the ways of collaboration fit in more than one cell in the table

## **Conclusion**

It-based instruction is an exciting and rapidly changing area of pedagogy. Everyone has a great deal to learn, with more new ideas and new software and hardware appearing almost daily. In this article, we shared some of what we have learned about conducting IT-based instruction. We explained why we believe that students can benefit when group activities feature among the modes of IT-based learning and stated that the research and practical work done under the heading of cooperative learning provide crucial insights into the dynamics of such digital groups.

We are just beginning to learn about using computers in our teaching. No doubt, you, the readers of this article, will have many more ideas on how to enhance student-student collaboration in IT-based learning. Perhaps, you will be so kind as to share your insights and experiences with us and with your colleagues in the schools and MOE. In that way, we can also explore the dynamics of digital teacher-teacher interaction. Thank you.

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