

Using Information and Communication Technology in a Collaborative Classroom to Improve Student Achievement

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Abstract *This paper discusses the fundamentals of cooperating teaching - the role of general subjects teacher as well as the role of the special education teachers in a collaborative classroom. Enhances was laid on two roles of the special education teacher which are - permanent and temporary co-teaching roles. Also discussed were necessary steps needed for effective planning for collaborative teaching. The paper later gave examples of some technology devices that could be used for educational application and steps to follow to improve students' achievement through the use of ICT. Finally, conclusion was drawn.*

Keywords: Cooperating teaching, inclusive classroom, special education, planning, collaboration, ICT.

Introduction

Historically, teachers have worked in isolation - one teacher to a classroom. As children with disabilities entered the public schools in the 1970s, they were taught in separate classrooms with their own teachers. Over the past 25 years, these students have slowly moved into the flow of the regular classroom, thus the use of the term "mainstreaming." (Suzan Ripley, 1997). He further stated that students, although they were mainstreamed for selected subjects or parts of the day; they were not considered part of the typical class. Now the philosophy is to include all students in the same class, which has brought about teams of general education and special education teachers working collaboratively or cooperatively to combine their professional knowledge perspectives, and skills.

The biggest change for educators is in deciding to share the role that has traditionally been individual: to share the goals, decisions, classroom instruction, responsibility for students, assessment of student learning, problem solving, and classroom management. The teachers must begin to think of it as "our" class. This Digest explores the facets of this new collaboration between general and special education teachers.

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What is Cooperating Teaching?

Cooperative teaching was described in the late 1980s as "an educational approach in which general and special educators work in co-active and coordinated fashion to jointly teach heterogeneous groups of students in educationally integrated settings (Suzanne Ripley, 1997). In cooperative teaching both general and special educators are simultaneously present in the general classroom, maintaining joint responsibilities for specified education instruction that is to occur within that setting" (Bauwens, Hourcade, & Friend, 1989).

This type of co-teaching actually has a number of names. The way this model works is that a content area teacher is in the classroom all the time. The special education teacher comes in and co-teaches one to three times a week. All students are able to benefit by having more face time with their teachers. Co-teaching gives each child that opportunity. For special needs children, this may mean help with reading a paragraph, learning a new language, or solving mathematical problems. Co-teaching brings special education's best

practices, which are really best for all children, into normal classrooms where they can benefit all students.

The distinctive feature of cooperative teaching, which differs from earlier approaches, is that it is direct collaboration with the general education and special education teachers working together in the same classroom most of the day.

An effective team of teachers will work together as equal partners in interactive relationships, with both involved in all aspects of planning, teaching, and assessment. Areas for this collaboration will include curricula and instruction, assessment and evaluation, and classroom management and behavior. The key to making co-teaching work is joint planning. They must both know the entire curriculum so that they can switch back and forth and support each others efforts.

In developing and implementing cooperative teaching, school professionals experience great changes in the way they go about their daily work. To overcome the inevitable fears and stresses associated with change, the educators involved must feel that they are responsible for the change and that its success or failure lies directly with them (Bauwens & Hourcade, 1995).

Role Played by each Teachers in a Collaborative Classroom

In a collaborative model the general education and special education teachers each bring their skills, training, and perspectives to the team. Resources are combined to strengthen teaching and learning opportunities, methods, and effectiveness. The one point that clearly developed from this relationship was that both of them had expertise in many areas, and combining these skills made both teachers more effective in meeting the needs of all students (Dieker & Barnett, 1996).

Typically the primary responsibility of general education teachers is to use their skills to instruct students in curricula dictated by the school system. Also, the primary responsibility of special education teachers is to provide instruction by adapting and developing materials to match the learning styles, strengths, and special needs of each of their students. In special education situations, individual learners' needs often dictate the curricula.

General educators bring content specialization, special education teachers bring assessment and adaptation specializations. Both bring training and experience in teaching techniques and learning processes. Their collaborative goal is that all students in their class are provided with appropriate classroom and homework assignments so that each is learning, is challenged, and is participating in the classroom process.

A Special Education Teacher's Role in an Inclusive Classroom

An inclusive classroom is one of the placement options for a student with a learning disability. This is the least restrictive form of education for special needs students and it allows the student to be included in a typical classroom environment with his or her peers.

There are two roles a special education teacher may play in an inclusive classroom — permanent or temporary co-teaching.

Permanent co-teaching

Permanent co-teaching offers students many advantages. In a permanent co-teaching arrangement, there is a content teacher, someone who specializes in a specific subject like history, and a special education teacher. The teachers share in the planning, implementing, and grading of lessons. This is great for all the students, not just those that fall under the special education umbrella. The one-on-one teacher to student time is increased because there is literally an extra teacher in the classroom. With an average classroom size of 20 to 30, each teacher could focus her attention on only 10 to 15 students. For a special needs student, this additional individualized contact is invaluable.

Planning for Effective Collaboration

Collaboration involves commitment by the teachers who will be working together, by their school administrators, by the school system, and by the community. It involves time, support, resources, monitoring, and, above all, persistence. However, the biggest issue is time - time for planning, time for development, and time for evaluating. Planning should take place at the district and the building levels, as well as at the classroom level.

District planning helps ensure that all resources will be available, including time, money, and professional assistance. District-level planning will take into consideration the effect change in one place will have on other settings. Building-level planning will assist the teams in being sure adequate support is in place to sustain new initiatives. Principals play an extremely important leadership role in facilitating collaborative efforts by instructional personnel.

Both district and building-level planning should provide staff development opportunities to encourage teachers and administrators to participate in classes, workshops, seminars, and/or professional conferences on cooperative teaching. Motivation is an important ingredient for success, but additional skills will be needed to realize the goals teachers set for themselves and their classes.

Planning also is a factor in selecting the students who will be part of the collaborative process. It is important to keep natural proportions of typical students, students identified as being at risk, and students who have been found to have disabilities. Achieving a balanced classroom is easier at the elementary and middle school levels than at the secondary level, where a certain amount of grouping takes place with course selection.

A major consideration is in arranging planning times for co-teachers. Co-planning must take place at least once a week, according to studies. Planning sessions were viewed as priorities by both teachers; they refused to let other competing responsibilities interfere with their planning sessions (Walther-Thomas, Bryant, & Land, 1996).

The planning must be ongoing to allow teachers to review progress on a regular basis, make adjustments, evaluate students, and develop strategies to address problems either in discipline or learning. Walther-Thomas and her colleagues (1996) found that five planning themes were identified by co-teachers who considered themselves to be effective co-planners:

1. Confidence in partner's skills;
2. Design of learning environments for both the educators and students that require active involvement;
3. Creation of learning and teaching environments in which each person's contributions are valued;
4. Development of effective routines to facilitate in-depth planning; and
5. Increased productivity, creativity, and collaboration over time. Participants in collaborative programs agreed that the time required for planning does not decrease during the year, but the quality of instruction continues to improve.

Different Types of Technology and their Educational Applications

Many different types of technology can be used to support and enhance learning. Everything from video content and digital moviemaking to laptop computing and handheld technologies (Marshall, 2002) have been used in classrooms, and new uses of technology such as podcasting are constantly emerging.

Various technologies deliver different kinds of content and serve different purposes in the classroom. For example, word processing and e-mail promote communication skills; database and spreadsheet programs promote organizational skills; and modeling software promotes the understanding of science and math concepts.

It is important to consider how these electronic technologies differ and what characteristics make them

important as vehicles for education (Becker, 1994).

Technologies available in classrooms today range from simple tool-based applications (such as word processors) to online repositories of scientific data and primary historical documents, to handheld computers, closed-circuit television channels, and two-way distance learning classrooms. Even the cell phones that many students now carry with them can be used to learn (Prensky, 2005).

Each technology is likely to play a different role in students' learning. Rather than trying to describe the impact of all technologies as if they were the same, researchers need to think about what kind of technologies are being used in the classroom and for what purposes. Two general distinctions can be made. Students can learn "from" computers—where technology used essentially as tutors and serves to increase students basic skills and knowledge; and can learn "with" computers—where technology is used a tool that can be applied to a variety of goals in the learning process and can serve as a resource to help develop higher order thinking, creativity and research skills (Reeves, 1998; Ringstaff & Kelley, 2002).

The primary form of student learning "from" computers is what Murphy, Penuel, Means, Korbak and Whaley (2001) describe as discrete educational software (DES) programs, such as integrated learning systems (ILS), computer-assisted instruction (CAI), and computer-based instruction (CBI). These software applications are also among the most widely available applications of educational technology in schools today, along with word-processing software, and have existed in classrooms for more than 20 years (Becker, Ravitz, & Wong, 1999).

According to Murphy et al, teachers use DES not only to supplement instruction, as in the past, but also to introduce topics, provide means for self-study, and offer opportunities to learn concepts otherwise inaccessible to students. The software also manifests two key assumptions about how computers can assist learning. First, the user's ability to interact with the software is narrowly defined in ways designed specifically to promote learning with the tools. Second, computers are viewed as a medium for learning, rather than as tools that could support further learning (Murphy et al, 2001).

While DES remains the most commonly used approach to computer use in student learning, in more recent years, use of computers in schools has grown more diversified as educators recognize the potential of learning "with" technology as a means for enhancing students' reasoning and problem-solving abilities. In part, this shift has been driven by the plethora of new information and communication devices now increasingly available to students in school and at home, each of which offers new affordances to teachers and students alike for improving student achievement and for meeting the demand for 21st century skills describe earlier. No longer limited to school labs, school hours and specific devices, technology access is increasingly centered on the learner experience.

Bruce and Levin (1997), for example, look at ways in which the tools, techniques, and applications of technology can support integrated, inquiry-based learning to "engage children in exploring, thinking, reading, writing, researching, inventing, problem-solving, and experiencing the world." They developed the idea of [technology as media](#) with four different focuses: *media for inquiry* (such as data modeling, spreadsheets, access to online databases, access to online observatories and microscopes, and hypertext), *media for communication* (such as word processing, e-mail, synchronous conferencing, graphics software, simulations, and tutorials), *media for construction* (such as robotics, computer-aided design, and control systems), and *media for expression* (such as interactive video, animation software, and music composition).

In a review of existing evidence of technology's impact on learning, Marshall (2002) found strong evidence that educational technology "complements what a great teacher does naturally," extending their reach and broadening their students' experience beyond the classroom. "With ever-expanding content and technology choices, from video to multimedia to the Internet," Marshall suggests "there's an unprecedented need to understand the recipe for success, which involves the learner, the teacher, the content, and the environment in which technology is used."

Universal Design for Learning (UDL) takes advantage of the opportunity brought by rapidly evolving communication technologies to create flexible teaching methods and curriculum materials that can reach

diverse learners and improve student access to the general education curriculum (Rose & Meyer, 2002). UDL assumes that students bring different needs and skills to the task of learning, and the learning environment should be designed to both accommodate, and make use of, these differences (Bowe 2000; Rose & Meyer, 2002). To promote improved access to the general curriculum for all learners, including learners with disabilities, Rose & Meyer (2002) have identified three key principles or guidelines for UDL:

1. Presenting information in multiple formats and multiple media.
2. Offering students with multiple ways to express and demonstrate what they have learned.
3. Providing multiple entry points to engage student interest and motivate learning.

For example, printed reading materials pose substantial challenges to the learning of students with disabilities (J. Zorfass: personal communication, October 2005). Technology can assist with such difficulties by enabling a shift from printed text to electronic text, which Anderson-Inman and Reinking (1998) assert can be modified, enhanced, programmed, linked, searched, collapsed, and collaborative. Text styles and font sizes can be modified as needed by readers with visual disabilities; read aloud by a computer-based text-to-speech translators; and integrated with illustrations, videos, and audio. Electronic text affords alternative formats for reading materials that can be customized to match learner needs, can be structured in ways that scaffold the learning process and expand both physical and cognitive access, and can foster new modes of expression through revision and multimedia (J. Zorfass: personal communication, October 2005). It represents one way that technology can support the achievement of students with disabilities.

Steps to Improving Students Achievement through ICT

Teachers can take the following steps to improve student achievement through technology.

- Determine the purpose of using technology in the classroom, as determined by the specified educational goals. Is it used to support inquiry, enhance communication, extend access to resources, guide students to analyze and visualize data, enable product development, or encourage expression of ideas? After the purpose is determined, select the appropriate technology and develop the curricula. Create a plan for evaluating students' work and assessing the impact of the technology.
- Coordinate technology implementation efforts with core learning goals, such as improving students' writing skills, reading comprehension, mathematical reasoning, and problem-solving skills.
- Collaborate with colleagues to design curricula that involve students in meaningful learning activities in which technology is used for research, data analysis, synthesis, and communication.
- Promote the use of [learning circles](#), which offer opportunities for students to exchange ideas with other students, teachers, and professionals across the world.
- Encourage students to broaden their horizons with technology by means of [global connections](#), [electronic visualization](#), [electronic field trips](#), and online [research](#) and [publishing](#).
- Ensure that students have equitable access to various technologies (such as presentation software, video production, Web page production, word processing, modeling software, and desktop publishing software) to produce projects that demonstrate what they have learned in particular areas of the curriculum.
- Encourage students to collaborate on projects and to use peer assessment to critique each other's work.
- In addition to standardized tests, use alternative assessment strategies that are based on students' performance of authentic tasks. One strategy is to help students develop [electronic portfolios](#) of their work to be used for assessment purposes.
- Ensure that technology-rich student products can be evaluated directly in relation to the goals for student outcomes, rather than according to students' level of skill with the technology.
- Create opportunities for students to share their work publicly--through performances, public service,

open houses, science fairs, and videos. Use these occasions to inform parents and community members of the kinds of learning outcomes the school is providing for students.

- Learn how various technologies are used today in the world of work, and help students see the value of technology applications.
- Participate in professional development activities to gain experience with various types of educational technology and learn how to integrate this technology into the curriculum.
- Use technology (such as an e-mail list) to connect with other teachers outside the school or district and compare successful strategies for teaching with technology info@ncrel.org (2005).

Conclusion

The concepts of individualized instruction, multiple learning styles, team teaching, weekly evaluation, and detailed planning are all of direct benefit to students. The purpose of the collaboration is to combine expertise and meet the needs of all learners.

It is important that teachers receive preparation and classroom support. It is also important that planning time continues to be available throughout the school year. "Most important, all students win by being challenged by collaborating teachers who believe that they are responsible for all children in the classroom" (Angle, 1996).

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