DOCUMENT RESUME

ED 472 971 SE 067 216

AUTHOR	Jablon, Paul; Van Sickle, Meta
TITLE	Investigating Phenomena and Negotiating Ideas in the Middle School Science Classroom and Community: Would the Teacher Please Be Quiet?
PUB DATE	2003-02-01
NOTE	12p.; Paper presented at the Annual Meeting of the Association for the Education of Teachers of Science (St. Louis, MO, January 29-February 2, 2003).
PUB TYPE	Reports - Descriptive (141) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Cognitive Development; *Community Involvement; Inquiry; Middle Schools; Problem Solving; *Science Curriculum; Science Education; Science Process Skills; *Science and Society; *Teaching Methods

ABSTRACT

In their complex nature, early adolescents want to believe in their teachers. Teachers demonstrating what they believe earn respect from students. In science education, it is vital to link scientific phenomena to daily life and social decision making skills to engage students in developing science-process skills. The science-technology- society (STS) curriculum serves as an excellent framework for this purpose with early adolescents. This paper reviews inquiry-based and STS science teaching and discusses classroom practices to maximize the effectiveness of the curriculum. (Contains 18 references.) (YDS)

Investigating Phenomena and Negotiating Ideas in the Middle School Science Classroom and Community: Would the Teacher Please Be Quiet!

a paper presented at

The AETS National Conference
St. Louis, MO

February 1, 2003

Dr. Paul Jablon

Lesley University
pjablon@mail.lesley.edu
(617) 349 8656

Dr. Meta Van Sickle

University & College of Charleston
vansicklem@cofc.edu
(843) 953-6357

Post-modern Early Adolescents and the Science Classroom

Although early adolescents in post-modern society have been exposed by way of the no longer age-differentiated media to all the depravity of the world throughout their childhood, their cognitive development at middle school age allows them to have a deeper, yet naïve, insight into issues of brutality, violence, and sexuality (Elkinds, 1997). Simultaneously, in most cases they are quickly moving to a place where they are controlled more by their peer's acceptance and norms than by their parents. Their newly expanding cognitive abilities are as difficult to manage as their awkward out-of sync bodies. The world seems out of control and certainly out of their control. They are desperately attempting to make models and theories for how their world works and how they can be competent within it. Yet, they are novices, and when left on their own appear to be failing miserably and consistently. Or are our students simply enacting age appropriate high jinx through which they will learn some essential life lesson?

So if this is the post-modern early adolescent, then what needs to be waiting in their middle school that will truly engage them in participating in the world of science? What type of participation will allow the student to gain skills, understandings, and habits that will empower her/him to prosper? If these are their needs, then what is it about the scientific enterprise that could create a milieu in which they could work together with an adult and other students to satisfy these psychological necessities? For needs are hierarchical (Maslow, 1968), and if the scientific skills, concepts and habits of mind are not situated in a fertile environment that satisfies the prerequisite needs, students will truly not engage and meet the objectives that science educators have so carefully crafted for them.

Many teachers and school science departments have been trying for the past two decades to adapt their teaching practices to align with this emerging knowledge of how humans, and in particular early adolescents, learn. Significant advances have been made on a procedural level. The surface structure of many classrooms has changed, appearing more student-centered with students sitting in groups and engaged in hands-on activity. One question we can ask about this apparant structural change is, "Is the classroom truly more student-centered or is the procedure a cover that gives the appearance of student-centered activity?" The key here is, substance or appearance change.

However, by not addressing deeper cultural issues the impact of these procedural changes has been constrained. The underlying interactions and goals have for the most part remained unaltered (Tobin, 1990; Flick, et al., 1997). These gradual procedural changes in teaching have not created classroom communities that reflect the scope of necessary components for science classroom practice to match the ideas about early adolescents delineated in the above paragraph. These ideas have also, not significantly affected science achievement. These procedural modifications in instruction attempted by individual practitioners have not been sufficient to match our new understandings of how and what early adolescents should learn in (and outside of) our science classrooms.

A small number of teachers, departments, and schools have radically altered the culture of their classrooms to reflect these new understandings and found the effectiveness of the change startling both in the cognitive and affective performance of their students (White and Frederickson, 1997,1998; MacIver, 1990). Both the students' and the teachers' roles have shifted: the types of expectations, social interactions, level of cognitive application, methods of communicating understanding, and acceptance of responsibility for assessing learning have all been redistributed to better match our understandings of how our brain remembers, understands, reasons, and transfers skills, and under which circumstances students will engage their brain to focus on scientific phenomena and process.

> Given the urgency of children's psychosocial needs during the middle grade years and their vulnerability to the debilitating effects of rejection and abuse, no one questions the importance of their feeling cared about and respected by the adults in their lives. Young adolescents scrutinize more carefully than ever the dispositions and idiosyncrasies of the

> grownups they're responsible to. So, to a great extent, it is warranted to assert that no matter what textbooks, materials, curriculum guides, and such are employed, the teachers are the curriculum Therefore, working out comfortable, secure, interpersonal relationships between adolescents and adults is a high priority (George, et al. 1989, 17).

So how are these relationships worked out in a science classroom? Perhaps that is already the wrong question by assuming that it can be done solely inside the science classroom. As noted in the opening paragraph of this paper, middle school students have life development patterns that fit into the traditional *physical*, *social*, and *cognitive* categories. As such, there are certain questions that we can ask, and then subsequently consider about how the teacher can encourage the likelihood that an early adolescent will want to study science, want to come to class, and be less inclined toward behaviors that are not conducive to learning.

The Dichotomy of Early Adolescent Behaviors and Needs

Middle level students want and need to believe in their teachers. However, teachers must earn that respect. A number of studies have shown what early adolescents recognize as effective behavior in their teachers (Beane and Lipka, 1986; Stevenson,1986). Respected teachers don't just verbalize what they believe; they demonstrate their values in their interactions with students, fellow teachers, and people in the community. They give their students clear messages that they are understood and their issues are taken seriously. These teachers are worthy models for their students' deference and their students recognize and respond accordingly by engaging in serious academic study. If students are really to be *understood,* then what qualities of early adolescents need to *be taken seriously* in the design of an effective science-learning environment?

Early adolescents are consumed with the unfairness of society in general and personally with the **unfairness** of the way adults, especially their parents and teachers, interact with them on a daily basis. They crave opportunities to help **establish the rules or procedures they will live by.** Yet they are beginning to realize the complexity of decision-making and their own novice status as many of their on-the-spot decisions turn out to have less than satisfactory results. We often hear, "That's not fair" from our middle school students. When we hear, that's not fair, it is time to remember that we are teaching early adolescents and that they want and need to help develop the rules.

Science, by the nature of the enterprise, has an inherent method of fair testing, and a set of problem-solving approaches. However, in order to engage students in acquiring these science-process-thinking skills and consequent conceptual understanding of scientific phenomena, these must be linked, almost daily, to personal and social decision-making skills as well. The decision-making models that accompany effective science-technology-society (STS) curricula serve as an excellent template. However, the science teacher, working in close cooperation with other subject area teachers, must not only apply these protocols to STS societal models, but also to the students' personal and social group decision making situations in order to maintain their engagement in the academic tasks.

Cheek's (1992) work on STS models in education describes ways of thinking about using these STS approaches in the classroom. Hickman, Patrick, and Bybee (1987) go further in asking five questions that they feel should be answered as a guide to selecting appropriate content. These five questions are:

1. Is the material directly applicable to the lives of our learners now (not just in the future and not just in other classes they may take someday)?
2. Is the material consistent with the cognitive development and social maturity of the students? (We would add the physical development of middle school students to this question.)
3. Is the topic important in the world today and is it likely to remain important for a significant proportion of the students' adult life?
4. Can students apply the knowledge in contexts other than science?
5. Is it a topic for which students show an interest and enthusiasm?

These questions frame the reasoning for classroom suggestions in the remainder of the paper. These questions help us go beyond what is fair and fair testing by helping us and our students examine what is really meaningful and lasting in terms of content and thinking skills.

Seemingly, early adolescents are almost at odds with this intellectual quest for decision-making skills, and testing of those skills by controlling their own lives and that of society, for there is an overwhelming identity need at this time to be **competent**, to be **doers** and **producers**, and to be **known by others for what they do well** (Erikson, 1968). Much of this demonstration of competence is accomplished by a combination of physical and intellectual prowess that results in a real, tangible public presentation by the student. Therefore, while a good deal of the practice of the physical, cognitive, and emotional skills needed for this exposition can take place in the classroom, other skills need to be practiced outside of the school. Likewise, some of the motivation for perseverance can come from within the school building, but a virtually untapped plethora of early adolescent motivators exists within the community surrounding the school. Even this issue of perseverance is seemingly dichotomous with the nature of the early adolescent who is often consumed by a variety of **intense, but short-lived, interests** (Jenkens, 1998). By wanting to make the content too in-depth we chance losing our students interest and hearing the proverbial, "I'm bored, what else is there to do." Or worse, "There's nothing to do."

As if this matrix of needs and behaviors was not already complex, all of these cognitive and social dilemmas are taking place within the context of physical body changes that are startling, inconsistent, disconcerting, and sometimes uncomfortable and almost painful.

An Effective Middle School Science Experience

Despite the complexity of early adolescence, there is a model of science education practice that is responsive. At the core of this practice is a variety of inquiry-based and

STS science teaching interwoven with exemplary responsive and democratic classroom structures, supplemented by community-based science and social advocacy projects. Any one of these structures is insufficient to motivate, engage, and sustain early adolescents by itself. It is the carefully crafted matrix of these strategies that makes science accessible to all early adolescents.

Effectively utilizing Nationally-Validated Curricula

As a nation we have, under the leadership of the National Science Foundation, created not only a set of developmentally appropriate topics to be studied by early adolescents (NRC, 1996), but a set of hands-on, minds-on curricular units that address these concepts, skills and habits of mind. *SEPUP, FOSS, STC, Event-Based Science*, and *Investigating Earth Systems* are some examples of these. Although these nationally validated inquiry-based science curricula units should be the backbone of middle school classrooms, these materials need to be used in a way that allows students to follow their own interests evolving out of these curricula and subsequently demonstrating their own areas of competence.

The use of these materials assumes that these concrete operational students are beginning the investigation of any scientific phenomenon by explorations of the phenomenon before any introduction of concepts. Students in small science teams negotiate ideas and create their own naïve understandings. This assumes **daily manipulation of physical materials and ideas**. Without this daily physical and mental manipulation, Piaget's *equilibration* cannot take place. Healthy intellectual growth during early adolescence is in large measure a blending of what is already known or understood with manageable new experiences. Helping to facilitate the blending of physical experiences with critical thinking in the classroom is a complex but critical challenge for teachers. In order to have students make the transition to abstract thinking abilities, this bridge from the physical world to the thinking world must happen. So how do you get students who can be so sophisticated one minute and so childlike the next to make this transition?

While engaging students in these exemplary curricular explorations, and subsequent concept introduction and clarification it is important to go from concrete experiences, to group discussion, to pictorial representations of conceptual relationships in order to see if the students can draw what happened. Then we go to discursive and see if they can write what they learned. In order to include students in this process, effective teachers earnestly engage students, in regular, open conversation. Communication characterized by careful listening, thoughtful reflection, and taking turns is key to both language and critical thinking development. It is also necessary for adults to candidly convey their own questions and puzzlements as a model for students to emulate.

Some of the classroom practices necessary to maximize the effectiveness of this curricula in the classroom include:

• Giving no answers to questions if the teacher thinks that students could uncover some insight on their own. Ask questions until the student is able to answer using examples from thier neighborhood.

• Giving no background information prior to the lesson, but allowing students to start by exploring a particular broad physical phenomenon.
• Having students reveal to others their individual and group preconceptions of a phenomenon as they explain, and defend with evidence their thinking. It is understood that students already come to the classroom knowing something about the phenomenon and that any new, more coherent, and deeper understanding they will create will be a reconstruction of these original ideas through their own struggles with the issues.
• Students are expected to construct their own naïve, incipient understanding about and among concepts. This awareness will allow the teacher to anticipate some of her students' confusion and recognize why the students have difficulty grasping particular alternative ideas.
• "Mistakes" in both concepts and reasoning are not only expected, but welcomed. These are subsequently expected to be remedied by further work by individuals and groups of students. The students are expected to eventually learn to determine for themselves if they understand.
• Students and groups are expected to frame some testable questions about the relationship between factors that they thought played a role in this phenomenon.
• Students are expected to negotiate ideas with one another.
• The classroom models the notions of peer review and verification. What the classroom scientific community "knows" is based on their own observations, discussions, and analysis, and reference to their own prior investigations, knowledge, and reading. Their knowledge is tentative and evolving, with current understandings posted daily on newsprint and in student journals.

This practice allows these early adolescents to make their own decisions within the context of a system that works at helping them frame a method of reasoning and decision making. As much as possible, these predetermined curricular units need to be infused with as much student decision making as possible. One obstacle to the practices named above is that students who have not received this kind of education in the past will resist. Usually, they will change into active thinkers as soon as they have had a brain chemical rush through an "AHA" moment. It is even better when the teacher catches this student in the aha moment and confirms that, "Yes, it feels good to learn."

Moving to Individual and Small Group "Interest-Motivated" Investigations

While these formal curricular units should guide the curriculum, these early adolescents need to tap into their *related* areas of interest and be encouraged to conduct investigations prompted by these interests. These scientific investigations need to be embedded with lots of other disciplines. Not just the big four, but also (and especially) art, music, physical education, and industrial arts. These allow *portals of entry* into science for students with other foci. Thus evolve independent studies being carried out by small self-selected groups of students who want to pursue common interests. Studies that exemplify variety and choice make it more likely that students will experience and pursue meaningful academic learning at this critical time in their intellectual development. Students become an expert on a given topic. These middle graders who as previously stated are often consumed by a variety of intense but short-lived interests, can capitalize on these self-designed units composed of short investigations into a variety of topics. Interestingly, all the student-generated topics contain the need to know core science content.

These investigations, although conducted mostly outside of classroom time, need to be a part of the weekly classroom schedule. Getting to go to the library or media center, or even to the Internet-access computer on the other end of the classroom, allows these early adolescents desperately needed physical movement.

Keep Them Moving!

It is obvious that students at this age are growing and growing fast—within a wide range of when it happens. There is the Guido-like sixth grader, taller and stronger and faster than all the other boys, who suddenly has all the girls flocking after him. His joints hurt him and he can't sit still. Puberty has hit and he thinks he's figured out, "what it's all about," and is going to go for it. On the other end of the spectrum is the scrawny eighth grader who still looks like a fifth grader with that smooth baby face, stick thin arms and a nose way too big for his face. He usually gets relegated to "the dorks" club and picked at by those larger than he is. However, both are learning to cope with physical aches and pains of growing too fast for the meniscus in their joints to keep up, both have raging hormones and both **need** to move. The anterior cingulated in the brain is very active when novel movements or new combinations of movements are tried (Jensen, 1998). Jensen further explains this phenomenon as; "Our brain creates movements by sending a deluge of nerve impulses to either the muscles or the larynx. Because each muscle has to get the message a slightly different time, it's a bit like a well-timed explosion created by a special effects team." This brain-body response is called a spatiotemporal pattern. Middle school teachers should be ready for this kind of action. The body is calling for movement so that the joints can grow and stretch properly. Now, how do we us this to our advantage so that such students learn as they move?

The connection between movement and learning is clearly evident throughout life (Jensen, 2000). Other research shows that to deprive a child of movement is creating a likelihood of violence. We sit these middle schoolers in their chairs for 45-90 minutes when their brain is telling them to move and we wonder why we get problems. We've all seen the early adolescent boy or girl literally explode up out of her/his seat with a vociferous howl at the end of class. Could it be that we caused this behavior "problem"? In addition to the movement created by the individual investigations, when we are in whole class situations we could:

- role play the situation instead of sit and dialogue the situation.
- do energizing activities such as throw a ball when you ask a question and the one who catches it gives the answer.
- rewrite lyrics to a song to retell the learning and lead the class in the singing it.
- take stretch breaks working major muscle groups while detailing the muscle names and effects of aerobic and anaerobic exercise.
- enact "group building games" such as the human knot, mirrors, etc.

Out of the Classroom and Into the Community

When we really get on a roll with inquiry teaching we reach the relevance and the creative parts of science. We've all heard the middle school student say, "Hey, Yo, why do I have to learn this junk/stuff?" This is the time to tap into what they want to learn and why they might want to learn it. Bridge them into their own projects and get them to think—really think! Yet we must remember that their desire to be competent, to be doers and producers, and to be known by others by what they do well is couched within a social context, thus, any type of inquiry and problem solving needs to permeate both social and cognitive tasks. The most successful milieu in which to accomplish this is to get the students out of the classroom and into the community working with adults in real-world situations. This is the social advocacy extension of STS teaching advocated by Yager (1996) and others. Students who are confronted with real-word technology-science-social dilemmas in their own communities begin to need scientific understandings and skills in order to become powerful persons. They, likewise, need communication and other social skills and understandings in order to communicate their ideas to the larger public audience. They realize the need for their classroom activities, and emotionally and cognitively engage at a here-to-for unseen level.

1) Make the students set goals. What do they want to have an impact on? What do they want to learn? Why? Give the students choices and make sure they have valid reasons for their choices.
2) Increase the amount of feedback. Middle school students, like most humans, want meaningful hard work. If you don't respond they will not think the work was worth the effort.
3) It's cool to be able to describe what you know and explain why your solution could work. However, they realize what a solid public presentation should look like, as they are media mavens. Yet, they don't presently possess these skills. Provide the necessary scaffolding. This form of teaching increases language development.
4) Keep the palette changing and full enough, add materials and resources as needed to keep the students interested.
5) Remember good thinking takes time. Wait time was and still is important to higher order thinking.

Group dependent public presentations create positive alternative peer groups. This may be the first time they were ever "needed" at school for their input, and output. They need to work with public scientists and advocates. They need to conduct their own data collection in the field and in the libraries and public records of the community. They need to see themselves in the public arena as competent. Where youngsters learn to exercise authority, they also learn real responsibility. If the science teacher works closely with social studies, English, and creative arts teachers to not only have students apply their STS decision making protocols to public situations, but also to *analogous interpersonal relationships* (Jablon, 1994) in their lives, students will also have their more pressing needs met. This will allow them to focus on the academic matters at hand.

A Classroom Structure that Allows for Coping with Social Dilemmas.

In the area of social development, the stories of the middle schooler are everywhere. From the child who doesn't know how to dress and thus either looks outlandish in the chosen outfit or else looks "just like" everyone else. They are very social and need a lot of time to talk about how things "worked out" to figuring out their next moves. These social interactions inform their next "date" to "how to get their parents to listen to them." They really are a lot of fun. Their peer group can influence them to do or to not do. They are no longer babies, but still want approval. The next minute they want full autonomy. It is a good time for the teacher and the child to "lock horns," or for the teacher to forget who is the adult here—this age child can really get under your skin. This age child is all smiles one minute and tears of treachery the next.

This area is dealing with emotions. Many of us in the United States merely acknowledge that emotions exist, but we seem to not "like" them much. We think of emotions as causing us to be flighty, whimsical, uncontrollable, and erratic (Jensen, 2000). So how do we use these seemingly "out of control" emotions of the middle-schooler to open the opportunity to learn? The brain research shows that there is a neural pathway for emotions just like there is a neural pathway for cognitive learning. Jenson notes that the strongest pathways are when there is overlap of these two paths .

The brain research further supports the notion that emotions are part of our survival and thus are "hard wired" into our DNA. Jensen and other researchers state that, "we have been biologically shaped to be fearful, worried, surprised, suspicious, joyful, and relieved, almost on cue." Now, let's add that to the social stress of learning how to be an adult in terms of relationships with the opposite sex, taking responsibility for your life and other such factors. I'd cry too—and probably did—maybe even still do.

So how do we keep the child in an emotional state that is not so angry as to be irrational or so joyful that they cannot sit—not for even one minute.

1) Validate the role of emotions in our lives by the teacher role modeling emotions. Tell the students of the joy or sadness you feel when hearing about something from science. For example, I felt great joy when the Human Genome studies were in progress. The results that all humans seem to be about 99.9% alike made me happy because I've thought this was the case for a long time. Now I have evidence.
2) Celebrate students work, applaud, high five, dance in the aisle for 30 seconds. This is especially powerful after a long-term project that came to a successful completion. Have the students name two things they learned and then clap – raucously.
3) Happy rituals can help. Just don't let them get boring.
4) Have them journal and use introspection in these journals about current events and then get them to read their journaling to a second student. This is a time when the teacher can do some one-on-one dialogue with the student who is in need.

5) Have real open dialogue in the classroom about resolving conflicts in groups. Utilize the protocols of decision making while supplying coping mechanisms and self-administered mediation techniques.
6) Make it apparent that their emotional need to have the world predictable and within their control can be increasingly satisfied by hard work at their science related experiences. Likewise, when things are not solved, a demonstration of emotions is acceptable. These demonstrations should not impinge on others and should not stop their own growth.

Endnote

This is a model of science education that encourages both the teachers and students to:

- work cooperatively together on interdisciplinary, even multi-age teams,
- enjoy being together and creating experiences inside and outside of school that were meaningful and made them feel secure, confident, and committed to their own education.

Adults are actively participating in youngsters' lives, students are constructing their own knowledge, schools are committed to and deeply involved in community life, and teachers are cooperatively creating the kinds of learning experiences that breed excellence.

We teachers need to remember what is normal for "that age." In this case, we are talking about the early adolescent and need to remember that their brains do not work like an adult's, and in fact should not. We must give the students the opportunity to experience and to make mistakes. We must give them the tools of experience and thinking so that they can come to understand how the world works. When we give them such tools we are effectively working towards a science literacy expected by our national guidelines.

References

Barnes, M., Shaw, T. & Spector, B. (1989). *How Science Is Learned by Adolescents and Young Adults*. Dubuque, Iowa: Kendall/Hunt.

Beane,J. & Lipka, R. (1986). *Self-concept, self-esteem, and the curriculum*. New York: Teachers College.

Cheek, D. (1992). *Thinking Constructively about Science, Technology and Society Education*. NY: State University of New York Press.

Elkind, D. (1997). *All grown up and no place to go: Teenagers in crisis*. Cambridge, MA: Perseus Books.

Erikson, E.H. (1968). *Youth, identity and crisis*. New York: Norton.

Flick, L.B., Keys, C.W., Westbrook, S.L., Crawford, B.A. & Games, N.G. (1997). (March). Perspectives on inquiry-oriented teaching practice: Conflict and clarification. Paper presented at the annual meeting of the National Association for Research in Science Teaching, Oakbrook, IL.

George, P.S., Stevenson, C. (1989). The 'Very Best Teams' in the 'Best Schools' as described by middle school principals. *TEAM 3*, 6-14.

Hickman, P., Patrick, J. & Bybee, R. (1987). *Science/Technology/Society: A framework for curriculum reform in secondary science and social studies.* Boulder, CO: Social Science Education Consortium, Inc.

Jablon, P. (1994). Middle schools: Families or foes? *The Journal of At-Risk Issues.* pp.18-23.

Jensen, E. (1998). *Teaching with the Brain in Mind.* Alexandria, VA: ASCD.

MacIver, D. (1990). Meeting the needs of young adolescents: Advisory groups, interdisciplinary teaching teams, and school transition programs. *Phi Delta Kappan. 71*, 6, 458-464.

Maslow, A. (1968).*Toward a psychology of being.* Princeton, N.J.: Van Nostrand.

NRC (2000). *How People Learn.* Washington, DC. National Academy Press.

Stevenson, C. (1986). *Teachers as Inquirers: Strategies for learning with and about early adolescents.* Columbus, OH: National Middle School Association.

Tobin, K. (1990). Research on science laboratory activities: In pursuit of better questions and answers to improve learning. *School Science and Mathematics. 90*(5) 403-418.

White, B.Y. & Frederickson, J.R. (1997). *The ThinkerTools InquiryProject: Making scientific inquiry accessible to students.* Center for Performance Assessment, Educational Testing Service, Princeton, NJ.

White, B.Y. & Frederickson, J.R. (1998). Inquiry, modeling, and metacognition: Making science accessible to all students. *Cognition and Instruction 16*(1), 13-117.

Yager, R. (Ed.) (1996). *Science-Technology-Society: As reform in science education.* Albany: State University of New York Press.

SE067216

ERIC

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: Investigating Phenomena and Negotiating Ideas in the Middle School Science Classroom: Would the teacher please be quiet!

Author(s): PAUL JABLON META VAN SICKLE

Corporate Source:

Publication Date:

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents	The sample sticker shown below will be affixed to all Level 2A documents	The sample sticker shown below will be affixed to all Level 2B documents
PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY Sample TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) 1	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY Sample TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) 2A	PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY Sample TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) 2B
Level 1 [X]	Level 2A [ ]	Level 2B [ ]
Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) *and* paper copy.	Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only	Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Sign here, → please

Signature: Paul Jablon	Printed Name/Position/Title: PAUL JABLON Ph.D. Associate Professor
Organization/Address: Lesley University	Telephone: 617 349 8656 — FAX:
	E-Mail Address: pjablon@mail.lesley.edu — Date: 2/1/03

Share Your Ideas With Colleagues Around the World

Submit your conference papers or other documents to the world's largest education-related database, and let ERIC work for you.

The Educational Resources Information Center (ERIC) is an international resource funded by the U.S. Department of Education. The ERIC database contains over 850,000 records of conference papers, journal articles, books, reports, and non-print materials of interest to educators at all levels. Your manuscripts can be among those indexed and described in the database.

Why submit materials to ERIC?

- **Visibility.** Items included in the ERIC database are announced to educators around the world through over 2,000 organizations receiving the abstract journal, *Resources in Education* (*RIE*); through access to ERIC on CD-ROM at most academic libraries and many local libraries; and through online searches of the database via the Internet or through commercial vendors.

- **Dissemination.** If a reproduction release is provided to the ERIC system, documents included in the database are reproduced on microfiche and distributed to over 900 information centers worldwide. This allows users to preview materials on microfiche readers before purchasing paper copies or originals.

- **Retrievability.** This is probably the most important service ERIC can provide to authors in education. The bibliographic descriptions developed by the ERIC system are retrievable by electronic searching of the database. Thousands of users worldwide regularly search the ERIC database to find materials specifically suitable to a particular research agenda, topic, grade level, curriculum, or educational setting. Users who find materials by searching the ERIC database have particular needs and will likely consider obtaining and using items described in the output obtained from a structured search of the database.

- **Always "In Print."** ERIC maintains a master microfiche from which copies can be made on an "on-demand" basis. This means that documents archived by the ERIC system are constantly available and never go "out of print." Persons requesting material from the original source can always be referred to ERIC, relieving the original producer of an ongoing distribution burden when the stocks of printed copies are exhausted.

So, how do I submit materials?

- Complete and submit the *Reproduction Release* form printed on the reverse side of this page. You have two options when completing this form: If you wish to allow ERIC to make microfiche and paper copies of print materials, check the box on the left side of the page and provide the signature and contact information requested. If you want ERIC to provide only microfiche or digitized copies of print materials, check the box on the right side of the page and provide the requested signature and contact information. If you are submitting non-print items or wish ERIC to only describe and announce your materials, without providing reproductions of any type, please contact ERIC/CSMEE as indicated below and request the complete reproduction release form.

- Submit the completed release form along with two copies of the conference paper or other document being submitted. There must be a separate release form for each item submitted. Mail all materials to the attention of Niqui Beckrum at the address indicated.

For further information, contact...

Niqui Beckrum
Database Coordinator
ERIC/CSMEE
1929 Kenny Road
Columbus, OH 43210-1080

1-800-276-0462
(614) 292-6717
(614) 292-0263 (Fax)
ericse@osu.edu (e-mail)