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ABSTRACT

This study attempted to implement and validate a 5-month effort to transition 42 pupils with mild and moderate disabilities (most with learning disabilities) out of math instruction in special education resource rooms and into regular education math. A preliminary discussion examines the "cascade of services" model and transenvironmental programming as a means of facilitating least restrictive environment student placement. The process utilized computer assisted curriculum based measurement (CBM) to teach math operations in both special and regular education settings. This teaching methodology included goal setting, repeated measurement on goal material, and evaluation of the database to adjust instructional programs. The transenvironmental programming involved four phases: environmental assessment; intervention and preparation; promoting transfer across settings; and evaluation in the mainstream. Evaluation (via a math achievement test, a teacher questionnaire, and CBM data) indicated that experimental students outperformed controls in math achievement and were rated positively by both special and regular class teachers. In addition, whereas all 21 experimental students reintegrated into mainstream math settings either full- or part-time, not a single control student did so. (35 references) (DB)

A Conservative Approach to Special Education Reform: Mainstreaming through Transenvironmental Programming and Curriculum-Based Measurement

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Running head: SPECIAL EDUCATION REFORM

A Conservative Approach to Special Education Reform:
Mainstreaming through Transenvironmental Programming
and Curriculum-Based Measurement

In the swirl of publicity surrounding reform-minded white papers, policy statements, and Presidential pronouncements, many administrators, policymakers, and researchers have failed to take note of a divisive debate in special education, the outcome of which may have far-reaching consequences for mainstream classrooms and educational reform. At the center of the controversy is a ubiquitous model of special education service delivery known as the cascade of services.

The cascade-of-services model (E. Deno, 1970; Reynolds, 1962) represents a continuum of special-education-to-general-education placements. At one end is the mainstream classroom, a setting that guarantees students with disabilities at least physical proximity to nonhandicapped children. At the other end is the student's home or an institution, which most often precludes contact of any sort between students with and without disabilities. Whereas the number and type of special education services vary from one school district to another, Figure 1 depicts a typical cascade of services.

Insert Figure 1 about here

The Cascade in Federal Law

Placement in special education. When a student is judged eligible for special education, but before a specific placement is selected, Part B of the Individuals with Disabilities Education Act (formerly the Education of All

Handicapped Children Act) requires educators to consult their district's cascade of services to determine an "appropriate education" for the student. An appropriate educational placement must pass muster on two counts: It must provide for the student's unique learning and social needs, and must take place in a setting as close as possible to students without disabilities. Only a placement satisfying both criteria may be recognized as appropriate and as a "least restrictive environment" (LRE).

To illustrate how the cascade of services can help educators identify a LRE, consider the case of LaToya. In a team meeting, her mainstream teachers say the work is too hard for her; she is receiving failing grades and is showing increasing frustration and disruptive behavior. Further, the special educator says he has insufficient time to be helpful to them. Based on LaToya's difficulties and the unavailability of consultative support, it is decided that the Regular Class with Consultative Assistance option (see Figure 1) fails as an LRE for her, despite the fact that it would guarantee her maximal access to her more typical peers. Whereas a Full-Time Special Class placement could provide her with much needed one-to-one remediation and emotional support, the teachers dismiss it as too restrictive because its curriculum would be unchallenging for her and her peers considerably less able. In the end, a Regular Class Plus Part-Time Special Class is chosen as most appropriate; that is, LaToya's LRE.

<u>Post-placement in special education</u>. Whereas the cascade of services and LRE are central concepts in what Part B says about <u>initial</u> special education placements, these concepts are nowhere to be found in the section of the law describing educators' <u>post</u>-placement responsiblities. Duties such as (a) establishing an individualized educational plan, (b) conducting an annual review of student progress, and (c) administering a comprehensive reevaluation

at the end of 3 years are all discussed in terms of whether the student either should remain in the current special education setting or should be mainstreamed. There is no suggestion, let alone directive, that the student's future placement should be decided in a manner similar to how the current (i.e., initial) one was selected; namely, chosen from a carefully graduated continuum of options, and guided by the understanding that an LRE may, or may not, be the mainstream classroom.

The Cascade in Policy

The Council for Exceptional Children, this nation's largest professional organization for special educators, makes more consistent use of the cascade in its policy. Reflecting the indirect language of the courts (e.g., Hobson v. Hansen, 1967), which suggests the importance of a deliberate transition from current to future LREs, and consonant with best practice, Section VIII of the Council's bylaws states that if a student's designated LRE is not the regular classroom, an important objective for his or her teachers is to prepare the student for transition to a setting closer to the regular classroom, if not the mainstream itself. If, for example, an initial placement is a Full-Time Special Class, the teacher might be expected to prepare the student for transfer into a Regular Class Plus Part-Time Special Class (see Figure 1). Such preparation might include the teacher's purposeful adoption of important features of the regular classroom -- e.g., incorportating its curricula, instructional and motivational strategies, classroom rules and routines -- that would both familiarize the student with this placement and make his or her progress in the current class more interpretable in terms of the setting demands of the future one.

Thus, according to Council policy, no placement, save for the regular class, is viewed as permanent. Rather, self-contained classes, resource rooms, and the like are conceptualized as stopovers en route to the eventual destination of the mainstream classroom. This training-for-the-next-setting concept (e.g., Cardin-Smith & Fowler, 1983; Vincent et al., 1980) does not mean that sooner or later all students with disabilities will (or should) be educated in the regular classroom. It does mean that teachers and administrators must measure their works' worth in terms of how far they have helped advance their students "up" the cascade and how well they have prepared them for these closer-to-typical settings.

Policy versus Practice

"What if." If all special educators in a given district viewed the cascade as a dynamic concatenated system, and regularly trained students for the next setting, what might we see? Teachers and administrators from Hospital or Residential Placement to Part-Time Resource Room would work in synchrony, tuning activity in their respective settings to that of adjacent settings. This would demand frequent communication, visitations, and development of inclusionary and exclusionary criteria for guiding student movement into and out of the different levels of the special education system. An obvious result would be that many children would move "up" the cascade. Moreover, at its higher levels, teachers of resource and self-contained classes would work with regular educators to reintegrate students with disabilities into mainstream classrooms where more than a few might be decertified as disabled. An ultimate, bottom-line effect might be a leveling off of, if not a reduction in, special education enrollment and costs to local and state governments.

"What is." In fact, special education enrollment increased by 93,090 students in 1988-89, raising the number of students served nationwide to 4,587,370, a 23.7% increase over the number reported in 1976-77 (Annual Report to Congress, 1990, Table 1.1, pp. 5-6). In 1985-86 (the most recent year for which data are available), $16 billion was spent on special education nationwide, or $3,652 per student _above_ what regular education would cost, a 31% increase in per pupil expenditure from 1982-83 (Annual Report to Congress, 1989). Whereas special education students in some school districts make impressive academic gains (e.g., Marston, 1987-1988) and indeed move up the cascade and into the mainstream where some are decertified as disabled (e.g., Osborne, Schulte, & McKinney, 1991; Walker, Singer et al., 1988), the nationwide data on special education enrollment and cost suggest these districts are more the exception than the rule. In many school systems, the cascade of services may be more accurately characterized as a turgid backwater than as a swiftly flowing artery carrying students upriver. Why is this so? How to explain the serious disjunction between policy and practice in many places? The answer depends in part on who is doing the explaining.

Conservationists and Abolitionists

During the past 5 years, special educators have engaged in rancorous debate over what is wrong with the field and how best to fix it. Although the controversy has appeared wide ranging, including such diverse topics as testing, labels, accountability, and teacher referrals, it basically has pivoted on this question: Should special education abolish or conserve the cascade of services? It is this question that creates a meaningful divide among the major players in the debate, producing _conservationists_ and _abolitionists_ (see D. Fuchs & L. Fuchs, 1991).

Conservationists, by definition, support the preservation of the cascade. They do so because they believe it represents a rich array of placement options that is necessary if schools are to meet the diverse cognitive, behavioral, social, and physical needs of its students with disabilities.

Moreover, the degree of many students' disabilities, such as some with severe behavior disorders, require unique and intensive support. This help, say the conservationists, can often be delivered more efficiently and effectively in separate settings, such as self-contained classrooms, than in the mainstream (e.g., Kauffman, 1989; Walker & Bullis, 1991). And if too few special-needs students move up and out of the cascade, it is not the fault of the model; rather, it is the responsibility of those who use it incorrectly. In this vein, Part B of the Individuals with Disabilities Education Act is vulnerable to criticism from conservationists and others for its failure to emphasize that the LRE and cascade are as important in post-placement decisionmaking as they are during initial-placement deliberations (see above).

At loggerheads with conservationists are abolitionists who argue that the increasing numbers of children in special education are proof that the cascade model is unworkable; that it represents a trap for most students with disabilities whereby intial placements become terminal assignments in their educational careers (e.g., Taylor, 1988). Abolitionists and The Association for Persons with Severe Handicaps, the organization with which they are most closely connected, work to eliminate the cascade and for the immediate integration, or "full inclusion," of all students with disabilities in regular classrooms (e.g., Biklen, Ferguson, & Ford, 1988; Gartner & Lipsky, 1987). Facilitating full inclusion would be instructional aides, occupational and physical therapists, speech clinicians, vocational instructors, and other specialists bought by savings realized through an elimination of the cascade's special settings. Abolitionist optimism over this ambitious, if not radical, plan is based on a belief that special education is expendable because regular education has become more expandable; that is, more willing and able to accommodate greater student diversity, including the integration of all children with disabilities (e.g., Lipsky & Gartner, 1991).

We agree that changes must be made in special education. But we side with conservationists (e.g., Davis, 1989; Kauffman, Gerber, & Semmel, 1988) who argue that most mainstream settings are not willing or able to accommodate the degree of classroom heterogeneity that would result from a full-inclusion policy. Moreover, it is unclear how such a policy would affect current reforms like outcomes-based assessment, site-based management, choice, constructivist (or holistic) approaches to curriculum and instruction, and the training, recruitment, and retention of the current and future workforce. In keeping with an "evolution-not-revolution" outlook, we believe special educators must rediscover the meaning and purpose of LRE and the cascade of services; the field must understand that, in the final analysis, its success should be judged by how many children are moved responsibly "up" the cascade.

Purpose

In this study, our aim was to implement and validate a process by which pupils with mild and moderate disabilities, who are receiving math instruction in special education resource rooms, may be transitioned successfully into regular education math. We define successful as reintegrating children in such a manner that (a) they have the basic computational skills and school behaviors required by the mainstream setting prior to entry, and (b) the regular education math teachers are familiar with the returning students' strengths and weaknesses and are confident that the children are prepared to perform adequately and behave appropriately in their classrooms. An effective reintegration process should not only benefit the returning student, but also maintain, or improve, the quality of life of nonhandicapped students and teachers already in the targeted mainstream settings.

Prior to discussing methodology, we must describe the nature of our math intervention, a computerized version of curriculum-based measurement, and reintegration procedure. In these descriptions there is repeated reference to "project staff," persons trained by the first and second authors to provide assistance to student and teacher participants. The staff's professional background and project-related training and responsibilities are described later in the article.

Curriculum-Based Measurement (CBM)

CBM is a set of simple standardized procedures for obtaining reliable and valid measures of student achievement, which, in turn, facilitate teachers' on-going, or formative, evaluations of their teaching effectiveness. Standardized CBM procedures have been developed for measuring progress in reading, spelling, written expression, and arithmetic, and represent an alternative to commercially distributed achievement tests (see Deno, 1985; 1986; 1987). Research demonstrates that instructional programs designed with CBM can result in greater student achievement, enhanced teacher decision making, and improved student awareness of their own performance (L. Fuchs, Deno, & Mirkin, 1984; L. Fuchs & D. Fuchs, 1986).

In this study, there were two reasons for special and regular educators' use of CBM to teach math operations in their respective settings. First, it permitted them to conduct frequent assessments of academic progress and, thereby, to judge readiness for and adaptation in mainstream math on a student-by-student basis. In this sense, CBM was conceptualized as a dependent variable. Second, CBM data were used to develop more effective instructional interventions. Thus, it also represented a treatment, or independent, variable. A computer-assisted version of CBM (e.g., L. Fuchs, Hamlett, & D. Fuchs, 1990) was employed. It included goal setting, repeated measurement on goal material, and evaluation of the database to adjust instructional programs.

Goal Setting

CBM content was based on Tennessee's statewide math curriculum for grades 1-6. The math operations objectives tested at each grade were listed, and teachers in our study were encouraged to inspect these lists to determine an appropriate grade level on which to establish each student's goal. This level included the pool of problem types the teacher hoped the student would master by year's end.

Repeated Measurement

Using a standard measurement task, teachers assessed each pupil's math performance three times weekly, each time on a different test representing the type and proportion of problems from the goal level they had designated. For example, if a teacher chose a third-grade goal, the student was assessed with alternate forms that sampled the problem types in the proportion tested on Tennessee's third-grade, criterion-referenced end-of-year test. Each CBM test comprised 25 problems, displayed in random order, encompassing randomly generated numerals. Because these tests are really alternate short forms of the corresponding state's grade-level computation test, teachers using CBM could estimate progress toward mastery of the corresponding grade level of the state's curriculum.

Project staff trained students to take the tests at a computer. They were shown salient functions of the keyboard like the slash, decimal, space bar, return, and numerals; they were taught to read and interpret graphs; they were instructed to use Basic Math (L. Fuchs et al., 1990) software that automatically collects, scores, and stores CBM measurements in math; and they were observed using Basic Math until they demonstrated correct use of the software on two separate occasions. In other words, training continued until students demonstrated on two occasions (a) errorless interaction with the computer, most notably, a capacity to take tests independently, and (b) comprehension of the various data displays.

Evaluation of the Database

Each week teachers employed the Basic Math software, which automatically graphs individual students' scores, applies decision rules to the graphed scores, communicates the decisions to teachers, and conducts a skills analysis of students' responses to the test items.

Graph analysis. For the graph analysis, Basic Math displays a graph on the computer screen, showing (a) the pupil's performance over time, (b) a goal line reflecting the desired slope of improvement from baseline to goal, and (c) a quarter-intersect (White & Haring, 1980) line of best fit superimposed over the scores collected since the last vertical line and extrapolated to the goal date. Figure 2 shows a sample graph.

Insert Figure 2 about here

The decision rules prompted teachers to adjust students' math instruction in the following way. If, subsequent to any vertical line signifying a goal or teaching change, 4 consecutive scores fell below the goal line, the teacher was expected to introduce an instructional adjustment in an attempt to improve the student's rate of progress. If, however, this 4-point rule had failed to prompt a decision after 8 scores had been collected since the last vertical line (i.e., no 4 consecutive points fell below the goal line), the following trend-based rule applied: If the line of best fit was flatter than the goal line, the teacher adjusted the student's instructional program. Basic Math displayed the graph with the line of best fit and goal line. Below the graph, the correct decision appeared: "Uh-oh. Make a teaching change" or "insufficient data for analysis" (see Figure 2). When the teacher pressed <RETURN>, an explanation for the decision was shown.

Skills analysis. "Skills analysis" summarized students' mastery on each problem type. It subsumed two parts. Part I (Mastery Status) summarized the student's performance during the current half-month period. It showed the mastery category into which each problem type on the test fell: *not attempted* (0% problems attempted), *nonmastered* (less than 75% problems attempted, less than 85% accuracy; or, at least 75% problems attempted, less than 40% accuracy), *partially mastered* (less than 75% attempted, at least 85% accuracy; or, greater than 74% attempted, accuracy at least 40% but less than 85%), and *mastered* (at least 75% attempted, at least 85% accuracy). For each problem type, two additional numbers were displayed: (a) a ratio of attempted to possible problems across the summarized tests and (b) a percentage of correct digits achieved on attempted problems.

Part II of the skills analysis (Objectives History) summarized performance for each half-month interval across the year. It displayed: (a) half-month time intervals in columns, (b) objective types in rows, and (c) at the intersections of the time intervals and objective types, boxes with codes representing mastery levels. White boxes represented "not attempted"; striped, "nonmastered"; checkered, "partially mastered"; and black, "mastered." So, progressively darker boxes indicated greater levels of mastery. (See Figure 3 for a sample skills analysis. For technical information on the psychometric and edumetric properties of the graphed and skills analyses, see L. Fuchs, D. Fuchs, Hamlett, & Allinder, in press.)

Insert Figure 3 about here

Transenvironmental Programming (TP)

TP (Anderson-Inman, [1986]; Anderson-Inman, Walker, & Purcell, [1984]) comprises four phases, the first of which is environmental assessment. Since it is assumed that effective preparation for the mainstream can be accomplished best by first identifying the academic and behavioral expectations of this environment (see, for example, Gottlieb, Alter, & Gottlieb, 1991; Kaufman, Agard, & Semmel, 1986), the purpose of the first phase is to ascertain the specific skills and behaviors required for success in the mainstream classroom. This knowledge then can be used to help plan the content of instruction in the present special education setting. In the second phase, intervention and preparation, the special educator teaches the skills identified during the preceding phase as critical for success. Next, in promoting transfer across settings, the special education teacher helps ensure that the reintegrating student actually uses the newly acquired skills in regular education. In the final phase, evaluation in the mainstream, data are collected on the extent to which the pupil has adjusted academically and socially.

Anderson-Inman and her colleagues' notion of TP shaped much of our reintegration process. However, we did not always use it in neat linear fashion, whereby the second phase of TP only began after the completion of the first phase and so forth. Rather, as described below and illustrated in Figure 4, phases sometimes were pursued out of order and, on occasion, project participants were involved simultaneously in activity of two (or more) phases.

Insert Figure 4 about here

Environmental Assessment

Preliminary matching of reintegration candidates and mainstream math teachers. In a manner described below, special educators identified students they believed were appropriate candidates for reintegration in mainstream math. For each one, possible regular math teachers were identified. If there were more than one for a given student, then the teacher judged by the special educator as most likely to be receptive to mainstreaming was selected. This teacher was invited to a meeting with project staff and the special education teacher, during which the special educator communicated the project's purpose, described the reintegration process, and specified the roles and obligations of each participant. The special educator then provided evidence that the reintegration candidate was currently, or soon would be, ready for return to a mainstream math class. Such evidence included the student's level of math performance and a description of his or her classroom behavior. The special education teacher tried to present a balanced view of the child, documenting strengths and weaknesses. The mainstream math teacher then was asked whether reintegrating the student during the current school year seemed feasible. After the regular educator's (usually positive) response, the special educator made clear that such a solicited judgment was not binding, and that reintegration need not be immediate.

Identifying "low-achieving peers." Next, project staff stated that successful reintegration often requires knowledge about both the student and the regular classroom. The staff person indicated that a frequently useful question about regular classrooms is, "What constitutes the lowest acceptable level of academic performance?" The mainstream teacher was asked to think of three current students who represented a lowest acceptable math group; that is, a group whose members, while low achievers, were not in jeopardy of referral for possible special education placement. (These students hereafter are referred to as "lowest achieving peers," or "LAPs.")

If the regular classroom teacher believed it possible to work with the special education student, project staff obtained an estimated math grade level for him or her and the LAP group. This was accomplished by showing the special and regular education teachers a CBM math probe for each grade level, and asking them to identify the one that seemed most appropriate for the student in question. At this point, project staff also scheduled times to collect CBM baseline data on all four students.

Ecological inventory. Special educators conducted an ecological inventory of the mainstream math classes into which their students were expected to transfer. Concurrently, project staff conducted an inventory of the special educators' classes. The inventories used in regular and special education settings were identical, calling for classroom observations and structured teacher interviews. Special educators (in the mainstream) and project staff (in special education) observed and described three setting dimensions· physical environment (e.g., number of pupils, noise level, display of student work, the presence or absence of a wall clock, computer, and small group areas); teacher behavior (e.g., frequency and quality of praise, instructional pacing, level of monitoring of student work, degree of tolerance for student movement); and rules and procedures (e.g., what rules, if any, were evident and how were they communicated?).

Regarding the interview, special and regular teachers were asked to describe their expectations for classroom behavior (e.g., use of "appropriate language," cooperative peer interaction, use of free time), and for academic work behavior (e.g., the importance of staying in one's seat, following instructions, working without talking, ignoring disruptions, completing in-class assignments, seeking assistance, writing neatly, answering questions orally). They were questioned about their teaching behavior, that is, asked to describe their grouping for instruction (e.g., large, small, individual), their pedagogic style (e.g., lecture, interactive), and their use (or non-use) of various instructional strategies (e.g., seat work, peer tutoring, student self-instruction). In addition, they were quizzed about types of guidance they give students (e.g., physical prompts, oral direction, written or posted information), the frequency of chalkboard use, and the nature of math assignments, including homework. Finally, they were asked for the names of the math text and other supplemental materials used. (See D. Fuchs, Fernstrom, Scott, L. Fuchs, & Vandermeer, in press, for the ecological inventory.)

Following completion of the inventories, the special education teacher and staff person met to determine whether important differences distinguished the two settings. If salient differences were found, one or more became the focus of change. For example, the mainstream math teacher may have been observed infrequently to monitor and praise student work. By contrast, let us say it was determined that the special educator regularly monitored and praised students' work. Responding to these apparent disparities, the special educator might have encouraged the reintegration candidate to work more independently and with less encouragement. In so doing, the teacher would be attempting to align special education instruction more closely with mainstream instruction and, presumably, to facilitate a smoother student transition. Later, the special education teacher and staff member would make certain to discuss these apparent differences with the regular educator during the

Reintegration Planning Meeting, described below, in hopes of emphasizing the different setting demands with which the transitioning student was familiar.

Intervention and Preparation

Computer training, baseline data, and goal setting. Project staff trained reintegration students on keyboard and graph reading necessary to take the CBM math probes independently. Training was conducted during probes #1 and #2. Reintegration students took probe #3 independently, staff observed probe #4, and the students then took probes #5 and #6 on their own for a total of six baseline data points. After the last baseline probe was completed, staff and the special educator decided collaboratively on an end-of-year goal. Goal line training was then conducted in conjunction with the reintegration candidate's probe #7. Such training involved explanation to the student of the computer-generated positive trend line (see Figure 2), signifying a necessary rate of progress to achieve end-of-year math goals. Concurrent with reintegration students' computer training, staff administered six math hardcopy (not computer) probes to the LAP group, which were used as their baseline data.

CBM-aided math instruction. If, for example, it was determined that a reintegration candidate's appropriate instructional level was grade 1, the special educator attemped to facilitate the student's mastery of all five problem types at this level. These would include: (a) addition of two one-digit numbers with sums of 2-9; (b) addition of three one-digit numbers with sums of 2-9; (c) subtraction with minuends of 1-9; (d) addition of two-digit and one-digit numbers with no regrouping; and (e) subtraction of a one-digit number from a two-digit number with no regrouping. By using the Basic Math skills analysis, students' progress on these and other problem types was monitored regularly. If a student was not demonstrating sufficient progress on one or more problem type, the special educator and staff member reviewed the nature of current instruction with an eye toward modification.

To facilitate a search of alternative teaching strategies, a set of math packets was developed. Each represented several ideas for teaching a given operations objective in Tennessee's state-wide curriculum. The ideas, representing instructional and motivational techniques, as well as materials, were detailed in written descriptions. When special materials were required, staff provided them. Continued monitoring of students' progress followed adoption of a new or modified approach. In this trial-and-error manner, teachers continually explored strategies that kept students on-target in terms of reaching their individualized end-of-year goals.

Meeting #1: Reviewing the data. In the first formal meeting of the reintegration process, data collected on reintegration candidates and LAPs, and on the special and regular education settings, were analyzed by the special education teacher and project staff. These data were intended to help validate the special educator's choice both of the student as a reintegration candidate and of the regular classroom as a reintegration setting. Using these data, the meeting participants prepared for the "Reintegration Planning Meeting" with the mainstream math teacher.

Promoting Transfer across Settings

The "Reintegration Planning Meeting," the second sit-down, or formal, meeting of the transition process, began with the special education teacher and staff discussing any discrepancies between the two class settings revealed by the ecological inventories. Staff then shared data regarding the LAP group's performance on the CBM probes. Next, meeting participants discussed the validity of the ecological inventory and LAP data. 'he reintegration student was compared to his or her three LAPs, using the CBM data and teacher information. Special and regular educators and project staff looked for possible important discrepancies in these data.

Within this context of child and setting information, teachers and staff discussed whether the reintegration candidate might transfer immediately to the mainstream math classroom, or whether additional academic instruction or help with school behavior was necessary. If it was decided that the child should be placed at once in the regular classroom, the teachers planned an individualized educational plan (IEP) meeting and discussed continuing the instructional interventions and CBM monitoring in regular education. (Reintegrating students were required to have a minimum of eight CBM data points beyond baseline prior to reintegration.)

If, on the other hand, it was agreed that the reintegration candidate required more time in special education, the teachers then attempted to coordinate specific math curricula and instructional and motivational strategies. A timeline was constructed, including activities for each teacher and target dates by which to evaluate the reintegration student's progress and to hold an IEP meeting.

Evaluation in the Mainstream

Following placement of the student in the mainstream, project staff administered weekly CBM (hardcopy) probes to the LAP group, while the regular teacher ensured that the reintegration student took a minimum of two CBM probes weekly on the computer. At least once per week, staff met with the mainstream math teacher to provide technical assistance in formulating instructional changes as required, based on the CBM data. Staff also administered various posttests to reintegration students and the LAP group (see below). Finally, an evaluation meeting was convened, including the special and regular educators and staff, to discuss the mainstreamed student's progress. This meeting constituted an IEP meeting, if required by the school district.

Method

Participants

Special education teachers. In late Fall, 1988, we contacted special educators in two contiguous Tennessee counties to determine their interest in project participation. As quid pro quo, we offered a small cash stipend. Six in one county and five in the other agreed to participate, representing 7 elementary schools and 1 middle school. These 11 special educators were asked to identify either 2 or 4 students who, at some point in the school year, might be ready for reintegration into a mainstream math class. Specifically, the teachers were encouraged to consider each pupil's math performance, classroom behavior, and motivation in terms of their own sense of mainstream expectations. Thus, the identification process relied on special educators' informal understanding of implicit school norms, rather than a formalized procedure such as applying a cut-off score to performance on an achievement test. Collectively, the teachers identified 42 students.

The special education teachers were then asked whether these students could be assigned randomly to "experimental" and "control" groups. Most agreed. However, the teachers of about 20% insisted on choosing experimental group members. Moreover, among the children randomly assigned to this group, another 20% had their status changed to "control" when prospective regular educators refused to consider the possibility of reintegrating them. In all, 26 of 42 (62%) of the experimental and control pupils were assigned randomly.

Special education students. Of the 42 reintegration candidates, 21 were designated "experimentals"; 21 became "controls." Experimental students participated in the CBM and TP procedures described above. We expected such activity to foster relatively successful mainstreaming efforts. Reintegration also was planned for control students, but they were not to participate in CBM-aided instruction or TP. Rather, they were to be returned by their special education teachers in the "typical" or "usual" manner. The two groups were virtually identical in terms of race, chronological age, grade level, IQ performance, gender, and numbers of group members retained one or more school years (see Table 1). Among the 42 reintegration candidates, 37, 3, and 2 had learning disabilities, behavior disorders, and language impairments, respectively.

Insert Table 1 about here

Regular education teachers and LAPs. Participating special educators recruited 20 mainstream math teachers for the 21 experimental students targeted for reintegration. (One teacher agreed to reintegrate two.) Potential recruits (a) taught math at a time that corresponded with the student's scheduling needs, (b) taught classes that were not in danger of violating a state-mandated cap on class size, and (c) were open to the notion of reintegrating a student from special education. Thus, pragmatic considerations guided special educators' recruiting, which precluded random selection. Regular educators were offered a small cash stipend in return for their participation.

Table 2 provides descriptive information on the special and regular educators. It indicates they were alike in terms of race, age, and gender. Not surprisingly, they differed with respect to class size and number of years of experience in general education and special education. Mainstream educators also averaged more years in their current school than did the special educators.

Insert Table 2 about here

As mentioned, for each experimental student, the mainstream math teacher identified three LAPs; that is, students who, while "legitimate" members of the class, displayed the lowest acceptable level of academic achievement. Table 1 presents demographic and education-related data on these children, as well as on experimental and control students. It shows the three groups were indistinguishable in terms of race, grade level, and gender. LAPs, however, were younger, were participating in greater numbers in Chapter programs, and were less likely as a group to be retained 1 school year or more.

Just prior to the project's start, pupils in the three groups were administered the Stanford Achievement Test. On the Applications subtest, scaled scores were: $\underline{M}$ = 562.33 ($\underline{SD}$ = 47.52) for experimental students; $\underline{M}$ = 561.52 ($\underline{SD}$ = 42.60) for controls; and $\underline{M}$ = 573.44 ($\underline{SD}$ = 30.22) for LAPs. On the Computation subtest, experimental, control, and LAP group members' scores were: $\underline{M}$ = 573.43 ($\underline{SD}$ = 47.49), $\underline{M}$ = 577.62 ($\underline{SD}$ = 39.21), and $\underline{M}$ = 585.58 ($\underline{SD}$ = 35.38), respectively. A two-within analysis of variance (ANOVA; Experimental vs. matched Control/LAP and Computation vs. Applications subtests) did not produce a reliable main effect for group, $\underline{F}$ (2, 40) = 1.19, ns., or for the group x test interaction, $\underline{F}$ (2, 40) = .24, ns.

Project staff. Four project staff, who were doctoral students in special education and former special and general educators in public schools, were assigned two schools each. Across their two schools, each staff member worked with two or three special education teachers and between four and six regular educators. One contributed to the reintegration of six students and three worked indirectly with five. The average number of hrs. each staff person spent per reintegration candidate ranged from 18.40 to 52.00, with a median of 32.25 hrs. per student. Total time expended by staff in the eight project schools was 692.75 hrs.

Staff were trained to collect teacher and student data reliably (see below), and provide technical assistance to the special and regular education teachers. They were responsible for teachers understanding the reintegration process and CBM-aided math intervention; for having all necessary project-related materials; and for proceeding with reintegration in a timely fashion. Staff activity was guided by two lists of sequenced objectives, one for themselves and another for their teachers, and a timeline for each objective. In weekly meetings with the first author, compliance with and progress toward objectives were discussed. In short, as dispensors of technical assistance, staff were the on-site experts, facilitators, and monitors responsible for ensuring that project activities were completed with fidelity and timeliness. They had one more duty: To keep a written, running record of special educators' efforts to mainstream control students. Such documentation permitted exploration of the existence of "contagion"; that is, whether special educators began using TP and CBM to reintegrate their control, as well as experimental, students.

Measures

The Grade-Level Operations Tests (G-LOTs). As part of its 1984 Better Schools Program, the state of Tennessee redesigned its math curriculum by identifying grade-specific objectives in various domains. The G-LOTs (authors/date?) reflect the type and proportion of math operations problems in the state's curriculum for grades 1 through 6. The G-LOTs provide multiple forms of a timed 25-problem, grade-specific test, in which the problems are displayed randomly and consist of randomly generated numbers.

The G-LOTs for third grade, for example, assess addition of two addends with regrouping; subtraction with regrouping; subtraction with zeros in the minuend and regrouping; multiplication of two single-digit numbers; multiplication of two-digit numbers by one-digit numbers with regrouping; and division with divisors no larger than 9. At grades 1 through 6, respectively, the time limit (in mins.) for testing is 1.0, 1.5, 1.5, 3.0, 4.0, and 5.0. Performance is scored as the number of correct digits written in a student's answer within permissable time allottments.

For grades 3, 4, and 5, the tests correlate .58, .41, and .75, respectively, with the Math Computation Test-Revised (L. Fuchs, D. Fuchs, & Hamlett, 1989), which, in turn, correlates highly with the Concepts of Number (.80) and Math Computation (.78) subtests of the Stanford Achievement Test (L. Fuchs, D. Fuchs, Hamlett, & Stecker, in press).

Teacher questionnaire. Special educators completed a questionnaire consisting of three sets of items. The first required them to calculate the amount of time their experimental and control students spent in special education -- for math only and for all academic classes combined -- just before the project started and 6 weeks after a majority of experimental students had re-entered mainstream math classes. Project staff checked these numbers by consulting class rolls and examining students' IEPs. Special education teachers also were asked to estimate how much time their experimental and control pupils would spend in special education -- for math only and for all academic classes combined -- next Fall.

A second set of items directed the special educators to use a 5-point Likert-type scale (1 = negative, 5 = positive) to rate experimental and control students' readiness to return to the mainstream. Regular educators rated the experimental students and LAPs on the same items. Finally, special and regular educators again used a 5-point scale to indicate how practical and valuable the project was for them and their students.

Data Collection

Project staff administered the G-LOTs in one session to combined groups of experimental and control students and LAPs, with group size ranging between 5 and 8. Pretreatment testing occurred during the first ("environmental assessment") phase of the four-phase TP process, prior to training and implementation of interventions in special education. Posttreatment G-LOTs were administered 6-7 weeks after the experimental student was moved to the mainstream math class. The teacher questionnaire was administered by project staff only once: Special education teachers responded following completion of the intervention in their setting and just before the experimental student returned to the mainstream; regular educators completed it 6-7 weeks following the student's reintegation.

Data Analysis

Five points should be made about our data analysis. First, student performance on the G-LOTs was analyzed by a two-within ANOVA. It reflected the fact that experimental students were matched with control students and LAPs. An experimental versus control contrast, for example, was conceptualized as a repeated measures or "within" analysis, rather than as a between-group comparison. Second, the ANOVA was run twice: First, on the total sample of 21 experimental students and matched controls and LAPs; second, on a subset of 13 experimental pupils, and corresponding control students and LAPs, randomly assigned to treatments.

Third, because G-LOTs performance was measured weekly (also known as CBM data), as well as on a pre- and posttreatment basis, it was indexed by time-series slope analysis, as well as by ANOVA. Slope was calculated by determining each student's least-squares regression between calendar days and digits correct scores. G-LOTs slope, then, is the slope for the regression, representing an average increase in digits correct scores as a function of each increase in calendar days. Fourth, the teacher questionnaire data were analyzed by correlated (paired samples) *t* tests. Last, all analyses of student performance on the G-LOTs and teacher responses to the questionnaires were tested at the conventional two-tail probability level of $p < .05$.

Results

G-LOTs Performance

Total sample. Table 3 displays means and standard deviations of experimental and control students' and LAPs' pre- and posttreatment digits correct scores on the G-LOTs. A two-within ANOVA on the group and trial (pretreatment vs. posttreatment) factors did not produce reliable main effects, but did produce a significant group x trial interaction, $F\ (2, 40) = 7.27$, $p < .01$.

Insert Table 3 about here

Follow-up analysis was conducted in two steps. First, posttreatment minus pretreatment scores were calculated for the three groups. Second, correlated *t* tests compared the groups against each other using a difference between the difference scores. Posttreatment minus pretreatment scores were $M = 11.71$ ($SD = 11.46$) for experimental students; $M = 1.19$ ($SD = 10.12$) for control pupils; and $M = 6.56$ ($SD = 6.84$) for LAPs. Subtracting the control students' average difference score from the experimentals' yielded a reliable between-group disparity of $M = 10.52$ ($SD = 12.09$), $t\ (20) = 3.00$, $p < .001$.

Experimental students' difference score minus that of the LAPs' was 5.15 (*SD* = 13.80), *t* (20) = 1.71, *ns*. And the control group's difference score minus the LAPs' was -5.37 (*SD* = 11.98) -- a marginally significant disparity, *t* (20) = -2.05, *p* = .053. In other words, in comparison to controls, the experimental students' pre-to-posttreatment performance on the G-LOTs improved significantly, whereas the LAPs' academic gain was marginally significant. At the same time, experimentals and LAPs demonstrated comparable academic growth.

Randomly-assigned subset. Table 3 also shows G-LOTs performance of the subset of experimental and control students assigned randomly, as well as the scores of their LAPs. A two-within ANOVA, just like the one run on the total sample, generated very similar results; no reliable main effects, but a significant group x trial interaction, *F* (2, 24) = 4.61, *p* < .05. The experimental group's posttreatment minus pretreatment score was *M* = 6.46 (*SD* = 8.46); for controls it was *M* = -1.85 (*SD* = 9.18). The difference between these two means was 8.31 (*SD* = 9.60), *t* (12) = 3.12, *p* < .01. For LAPs, posttreatment minus pretreatment scores yielded a 5.83 (*SD* = 7.39) digits correct difference, virtually indistinguishable from that of the experimental group, *t* (12) = .18, *ns*., but reliably greater than the control group's change score, *t* (12) = -2.67, *p* < .05.

Slope Analysis

Experimental students' mean CBM slope in special education was .14 digits correct per day (*SD* = .16). Controls, by contrast, averaged .04 digits correct daily (*SD* = .17). In regular education, the reintegrated experimental pupils' slope diminshed to .00 (*SD* = .20), whereas the mean LAP slope was .14 (*SD* = .17). A two-within ANOVA on setting (special vs. regular education) and group (experimental vs. control/LAP) failed to produce reliable main effects for either factor. The setting x group interaction, however, was significant,

F (1, 20) = 5.65, $p < .05$, and is depicted in Figure 5.

Insert Figure 5 about here

A second analysis of the CBM data involved comparing the experimental students to their LAPs. Based on their CBM performance in special education, a trend line was plotted for each experimental student in regular education. A similar rate of progress was projected for every three-member LAP group based on their averaged CBM performance in mainstream math when the experimental pupil had not yet reintegrated. On average, 63% (SD = 36%) of the experimental students' data points in regular education fell below projected trend lines. This compares to only 44% (SD = 25%) for the LAP group, F (1, 20) = 4.36, $p = .05$.

Teacher Questionnaires

Time in special education. Table 4 displays the amount of time experimental and control students spent in special education for all academic instruction, as well as just for math, at pre- and posttreatment. The table also conveys special educators' estimates of how much time both groups would be in special education next Fall. Posttreatment minus pretreatment time in special education math for the experimental group was 47.38 mins. (SD = 17.69); for controls, it was 0.00 mins. (SD = 0.00), reflecting the fact that not one control student transfered to a mainstream classroom, whereas all experimental children were reintegrated full- or part-time. The difference between the groups' respective reductions was significant, t (20) = 12.28, $p <$ .001. Subtracting pretreatment time in special education math from teachers' Fall estimates resulted in an average increase of 3.95 mins. (SD = 14.59) for experimental students; a mean decrease of 6.71 mins. (SD = 19.25) for controls, representing a significant between-group difference, t (20) = 2.12, p < .05. Projected time in special education math in Fall minus the pretreatment time yielded mean reductions of 43.43 mins. (SD = 21.94) and 6.71 mins. (SD = 19.25) for experimental and control students, respectively, another reliable disparity, t (20) = 5.36, p < .001.

Insert Table 4 about here

Across all academic instruction, the experimental group reduced their time in special education from pre-to-posttreatment by 44.86 mins. (SD = 21.98). There was no pre-to-posttreatment reduction among controls (M = 0.00, SD = 0.00). Not surprisingly, given these descriptive data, experimental students' reduction was reliably greater, t (20) = 9.35, p < .001. The Fall minus posttreatment contrast yielded reductions in special education time of 10.67 mins. (SD = 34.61) for experimentals, and 12.19 mins. (SD = 31.13) for controls, t (20) = .20, ns. From pretreatment to next Fall, experimental pupils were projected to lessen their special education time by an average 55.52 mins. (SD = 36.75); controls, by 12.19 mins. (SD = 31.13), t (20) = 4.39, p < .001.

Ratings of students' readiness. Table 5 shows special educators' ratings (on a 1-5 scale, where 1 = negative and 5 = positive) of experimental and control students' appropriateness and readiness for reintegration, obtained just before the experimental students' return to regular math. Whereas there were no reliable between-group differences in terms of "appropriateness of academic skills" and "appropriateness of behavior," the experimental pupils were judged more ready to transfer.

Insert Table 5 about here

Table 6 displays special and regular educators' mean ratings of the experimental students on the same three dimensions as in Table 5. Special educators rated their students immediately preceding reintegration, whereas the mainstream teachers' ratings were obtained 6-7 weeks later. The Table indicates no differences between the two groups.

Insert Table 6 about here

Project's feasibility and value. Special and regular educators also rated the reintegration project in terms of its effectiveness (1 = unqualified failure, 5 = unqualified success), feasibility (1 = not at all feasible, 5 = very feasible), and contribution to their professional development (1 = not at all, 5 = very much) and extent to which it generally was worth doing (1 = wasn't worth doing, 5 = was definitely worth doing). Ratings are presented in Table 7. For both teacher groups they were comparatively high on each dimension, and there was no reliable difference between the groups.

Insert Table 7 about here

Discussion

This study's purpose was to evaluate a 5-month effort to prepare students with disabilities to transition successfully from resource rooms to regular classrooms for math instruction. Preparation included use of CBM to teach math operations and TP. The effectiveness of these procedures was examined through the use of a math achievement test (i.e., G-LOTs), a teacher questionnaire, and CBM data. Experimental students' and LAPs' pre-to-posttreatment gains on the G-LOTs were comparable, and both were greater than that of controls. This finding held for the entire sample and the subset of students assigned randomly to experimental and control conditions (see Table 3). Special educators' responses to the questionnaire, and a check of class rolls and other records, revealed that experimental students also substantially reduced the time they spent in special education math from pre-to-posttreatment; there was no change in this regard among controls (see Table 4). This latter result reflects the fact that, whereas all 21 experimental students reintegrated into mainstream math settings full- or part-time, not a single control student did so. Additionally, large between-group differences were observed when pretreatment time in special education math was compared to an amount projected for the students next Fall. And finally, similar results were obtained when students' time in special education across all academic areas was contrasted in terms of pretreatment to posttreatment, posttreatment to next Fall, and pretreatment to next Fall.

Given that experimental students out-performed controls in math achievement, and spent significantly and dramatically less time in special education math than control students, it is unsurprising that their special education teachers rated them more positively in terms of their readiness to transfer to regular education (see Table 5). Experimental (and control) students were also rated positively by their special education teachers on "appropriateness of academic skills" and "appropriateness of behavior" for the mainstream setting. Six weeks later in regular education, the experimental students were rated similarly by their mainstream math teachers.

These findings suggest that the reintegration project successfully prepared students with disabilities to take their place in mainstream math classrooms. Enhancing the importance of this conclusion is that few studies of reintegration exist. In a recent review of eight special education journals for 16 years, and the ERIC computer database, Scott and D. Fuchs (in preparation) found only nine investigations that attempted to validate an explicit process for moving students from a more restrictive to less restrictive setting. Many educational researchers and policymakers do not recognize that reintegration has been understudied because such investigations are often equated incorrectly with the more numerous mainstreaming studies. Mainstreaming studies, by definition, explore the effects on students with disabilities of being there; the students have already re-entered before such studies start. Reintegration investigations, by contrast, focus on the process of getting there; they begin with student participants in special education, not regular education, settings.

The present study, then, is one of only a handful of studies of reintegration. Moreover, in comparison with these investigations, it includes three times the number of student participants than the study with the next largest sample, and is one of only two that employs a control group. Nevertheless, our effort is not without its limitations, which, in aggregate, represent good reason to be cautious about its implications.

First, some may question our conceptualization of "group" as a repeated measure. Although this reflected the fact that the experimental students first were tested in special education and then in regular education, it also required that we think of (handicapped) controls and (nonhandicapped) LAPs as one and the same. Second, as mentioned above, special and regular educators volunteered to participate, and represent a self-selected group. As such, their project-related efforts are not necessarily indicative of the response one might expect from a majority of teachers to similar reintegration proposals. Third, special educators relied on personal judgment when choosing reintegration candidates, rather than on explicit formulae like a cut-off score. Although they appeared comfortable with the informality of such decision making, its lack of explicitness contributes to our uncertainty about how or why they chose who they did, and complicates our desire to provide direction to non-study teachers interested in transitioning students into the mainstream.

Fourth, CBM was used to aid special and regular educators' instruction of math computation skills. It is unclear whether our reintegration procedures apply to the mainstreaming of students with difficulty in the area of problem solving, let alone whether they may generalize to an entirely different academic area such as language arts. Fifth, there is the matter of our project staff. As mentioned, these persons provided technical assistance and facilitated the correct and timely implementation of project activity by school-based personnel. Moreover, in some schools, project staff assumed the role of the special educator after the experimental student's reentry into the regular classroom. They met regularly with the mainstream math teacher to evaluate the student's CBM data, his or her academic goals and progress, and the effectivenss of the teacher's current instructional strategies. The assumption of such activity by staff was necessary because special educators in the study had as many as 75 students with whom to work daily, and some had no opportunity to follow-up on their experimental students.

Would our reintegration approach have been as successful without this involvement of project staff? Probably not. Would the special and regular educators have rated the project's feasibility and worth as positively (see

Table 7)? Again, it is unlikely. Thus, we are not optimistic that our procedures are easily "exportable" to school districts where administrative leaders do not permit regular and special educators to meet regularly and plan for the responsible reintegration of students with disabilities.

At least one more study limitation warrants discussion. The 5-month duration of the reintegration process pushed study completion close to the end of the school year. As a result, reintegrated students' progress in and adaptation to mainstream math was evaluated only 6 to 7 weeks after re-entry. This is probably too short a time on which to base a claim for project effectiveness. Adding to this concern is our slope analyses of the CBM data. Remember that experimental students' progress was reliably better than that of controls in special education, but it was significantly worse than LAPs' achievement in regular education. On average, experimental students gained 0.00 digits correct daily in the mainstream, as compared with 0.14 digits correct per day in special education (see Figure 5). With experimental students showing no academic gain in regular education, how long might we expect teachers to tolerate them before their performance is (again) seen as insufficient to justify their presence? A more rigorous assessment of reintegration would require students with disabilities to spend more than 6 to 7 weeks in the mainstream before the onset of project evaluation.

Experimental students' academic progress in special education, but not in regular education, is consonant with anecdotal reports that special educators were more likely than their counterparts in regular education to work with project staff to evaluate the students' CBM data and, as indicated, modify teaching routines. Taken together, the anecdotal evidence and CBM data analyses appear to bolster conservationist claims that mainstream settings are incapable of accommodating student diversity. In describing results from a year-long descriptive study of 12 mainstream classrooms in an urban elementary school, Baker and Zigmond (1990) present a picture consonant with our findings. "The overriding impression," they write, "was of undifferentiated, large-group instruction, 'taught by the book.' The teachers did not seem insensitive to the needs of the slowest or the fastest student; but they were more committed to routine than to addressing...individual differences. This was a school with uniform expectations and practices for all..." (p. 525).

Judging by the experiences of the experimental students, then, conservationists seem right to conclude that only specialized settings like those constituting a cascade of services can deliver the intensive and individualized instruction that many students with disabilities require. On the other hand, one cannot ignore the experiences of our control students. Their academic achievement was meager in special education, and none transfered into a mainstream math classroom, despite our expectations that they would do so. Such outcomes support an abolitionist view that the cascade can indeed become a trap for many students. Business as usual, be it in special or regular education, often fails students with disabilities and undermines the true intent of the cascade of services. Recognizing that an effective reintegration strategy may require important modifications in special and regular education, we currently are implementing a "two-front" campaign in which (a) special educators are using TP to prepare students for transfer into regular reading classes, and (b) teachers in those settings are using classwide peer tutoring, which, we hope will strengthen their capacity to provide greater accommodation of student differences in reading performance.

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Table 1

Student Demographic Data by Group

	Experimental (n=21)			Control (n=21)			LAP (n=21)[a]				
Variable	%	M	(SD)	%	M	(SD)	%	M	(SD)	F^b	χ^{2c}
Caucasian students	100.00			90.50			88.10				2.70
Chapter 1 math	0.00			0.00			32.20				16.66[d]
Chapter 1 reading	0.00			0.00			32.20				16.66[d]
Chronological age (yrs)		10.52	(1.50)		10.76	(1.51)		9.62	(1.36)	3.47[d]	
Grade level		4.10	(1.18)		4.33	(1.24)		4.10	(1.18)	2.43	
IQ performance[e]		93.62	(14.52)		92.29	(10.23)		--	--	.17	
Male students	66.70			61.90			50.80				1.90
Retained 1 year or more	66.70			71.40			23.70				20.71[d]

[a]There were 21 sets of 3 LAPs, one set for each experimental student.

[b]2 and 40 degrees of freedom for chronological age and grade level; 1 and 20 for IQ performance.

[c]2 degrees of freedom for all analyses.

[d]$p<.001$.

[e]IQ performance refers to students' Full Scale score on the WISC-R. IQ scores were not available for students in the LAP group.

Table 2

Demographic Data for Special (SE) and Regular Educators (RE)

	SE teachers (n=11)			RE teachers (n=20)				
Variable	%	M	(SD)	%	M	(SD)	t[a]	x^{2b}
Caucasian teachers	90.90			90.00				.00
Chronological age (years)								4.45
26 - 30	9.09			15.00				
31 - 35	27.27			5.00				
36 - 40	36.36			25.00				
41 - 45	18.18			35.00				
46+	9.09			20.00				
Class size (no. of pupils)		10.36	(10.54)		24.95	(5.16)	4.32[c]	
Female teachers	100.00			90.00				.10
Professional experience in RE (years)		1.86	(3.26)		14.25	(7.61)	6.31[c]	
Professional experience in SE (years)		8.91	(5.22)		.46	(1.79)	7.20[c]	
Years in current school		3.50	(3.68)		9.13	(6.93)	2.95[d]	

[a]Separate variance estimate was used for each t test but one: chronological age, for which pooled variance was used. Each variable's corresponding degrees of freedom follow in parentheses: Chronological age (29); class size (12.69); professional experience in RE (27.89); professional experience in SE (11.31); years in current school (29).

[b]With Yates correction and 1 degree of freedom for race and gender variables; 4 degrees of freedom for chronological age.

[c]$p<.001$.

[d]$p<.01$.

Table 3

Student Performance on the Grade-Level Operations Tests[a]

	Total sample						Randomly-assigned subset					
	Experimental (n=21)		Control (n=21)		LAP (n=21)[b]		Experimental (n=13)		Control (n=13)		LAP (n=13)[b]	
Trial	M	(SD)	M	(SD)	M	(SD)	M	(SD)	M	(SD)	M	(SD)
Pretreatment	17.14	(8.98)	18.56	(10.40)	20.02	(7.02)	18.62	(9.01)	18.23	(9.76)	21.65	(7.54)
Posttreatment	28.86	(13.54)	20.05	(11.01)	26.59	(6.22)	25.08	(10.73)	16.39	(6.20)	27.49	(6.19)

[a]Scores represent the number of correct digits.

[b]LAP score is mean.

Table 4

Experimental and Control Students' Pretreatment, Posttreatment, and Projected (Next Fall) Time in Special Education Math and in Special Education across Academic Classes[a]

	Experimental (n=21)		Control (n=21)	
Trial	M	(SD)	M	(SD)
Math Class				
Pretreatment	52.86	(12.42)	52.00	(12.38)
Posttreatment	5.48	(14.34)	52.00	(12.38)
Next Fall	9.43	(19.19)	45.29	(20.26)
Across Academic Classes				
Pretreatment	123.43	(76.12)	114.19	(50.38)
Posttreatment	78.57	(75.33)	114.19	(50.38)
Next Fall	67.91	(67.67)	102.00	(44.81)

[a]Time is expressed in mins.

Table 5

Special Education Teachers' Posttreatment Ratings of Experimental and Control Students[a]

	Experimental (n=21)		Control (n=21)		
Measure	M	(SD)	M	(SD)	$F(1,20)$
Appropriateness of Academic Skills	3.71	(.78)	3.29	(.78)	2.84
Appropriateness of Behavior	3.86	(.79)	3.76	(1.04)	0.09
Readiness to Transfer	3.91	(.90)	3.10	(1.18)	5.17[b]

[a]Teachers' posttreatment ratings were made immediately before students transitioned into a mainstream math class.

[b]$p<.05$.

Table 6

Special Educators' (SE) and Regular Educators' (RE) Posttreatment Ratings of Experimental Students[a]

	SE teacher (n=21)		RE teacher (n=21)		
Question[b]	M	(SD)	M	(SD)	$F(1,20)$[c]
Appropriateness of academic skills?	3.71	(.78)	3.48	(.87)	.92
Appropriateness of behavior?	3.86	(.79)	3.81	(1.17)	.03
Readiness to transfer?	3.91	(.90)	3.62	(1.24)	.81

[a]SE teachers' ratings were obtained following treatment in special education and immediately preceding reintegration. GE teachers' ratings were obtained between the 6th and 7th week following reintegration.

[b]"Appropriateness" of academic skills and behavior refers to the degree to which a student's skill level and behavior approach typical mainstream expectations.

[c]None of these F values was significant.

Table 7

Special Educators' (SE) and Regular Educators' (RE) Global Ratings of the Project's Feasibility and Value[a]

	SE teacher ($\underline{n}$=11)		RE teacher ($\underline{n}$=20)		
Question	$\underline{M}$	($\underline{SD}$)	$\underline{M}$	($\underline{SD}$)	$\underline{t}$[b]
Contributes to professional development? (1=not at all, 5=very much)	3.36	(1.36)	3.50	(1.19)	.29
Project effective? (1=unqualified failure, 5=unqualified success)	4.18	(.60)	3.95	(.89)	.77
Project feasible? (1=not at all, 5=very much)	4.00	(.63)	4.25	(.79)	.90
Project worth doing? (1=wasn't worth it, 5=definitely worth it)	4.27	(.65)	4.35	(.67)	.31

[a]SE teachers' ratings were made following treatment in special education and immediately preceding reintegration. RE teachers' ratings were obtained between the 6th and 7th week following reintegration.

[b]$\underline{t}$ values were associated with 29 degrees of freedom; none was significant.

Figure Captions

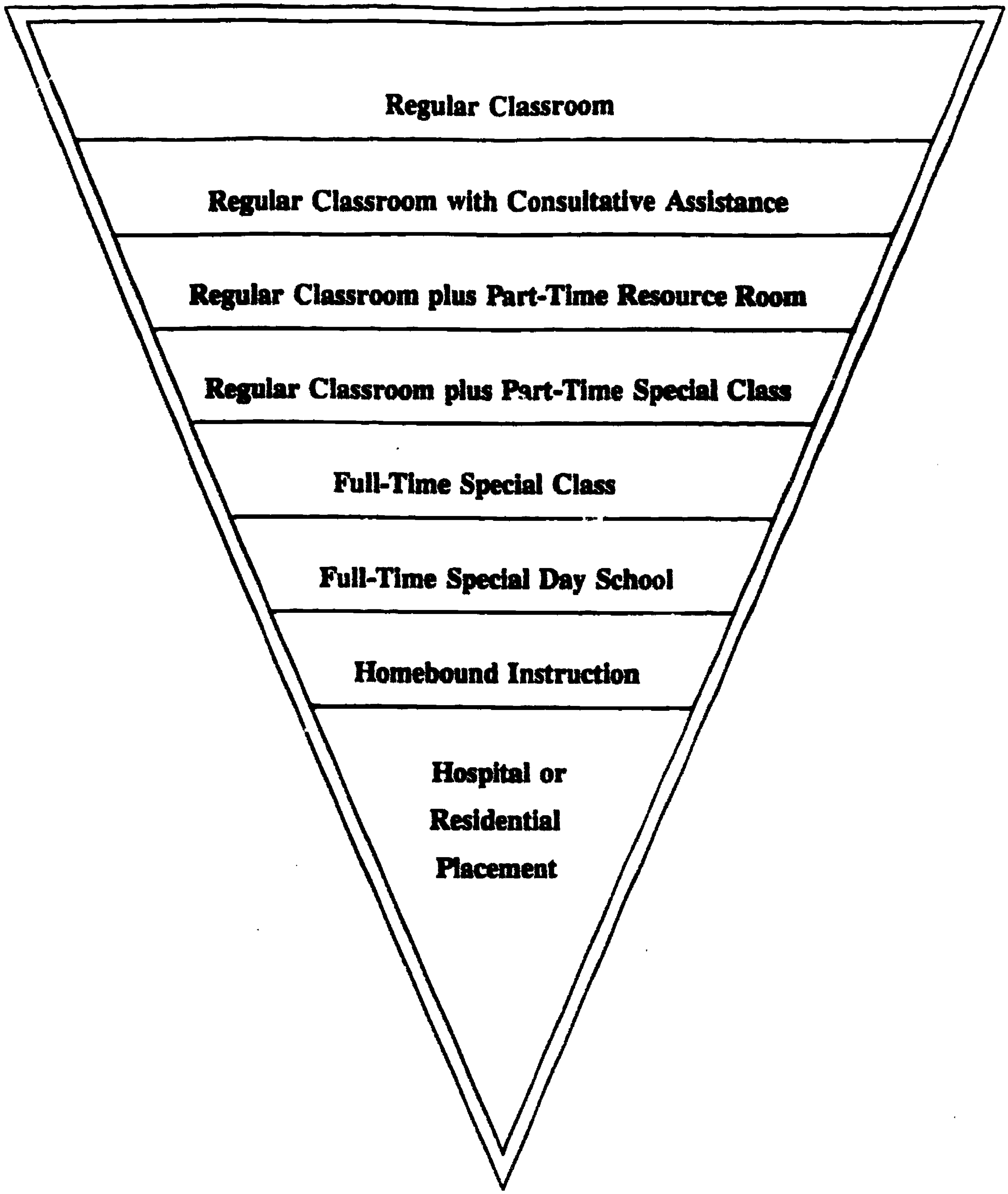
Figure 1. A cascade of services

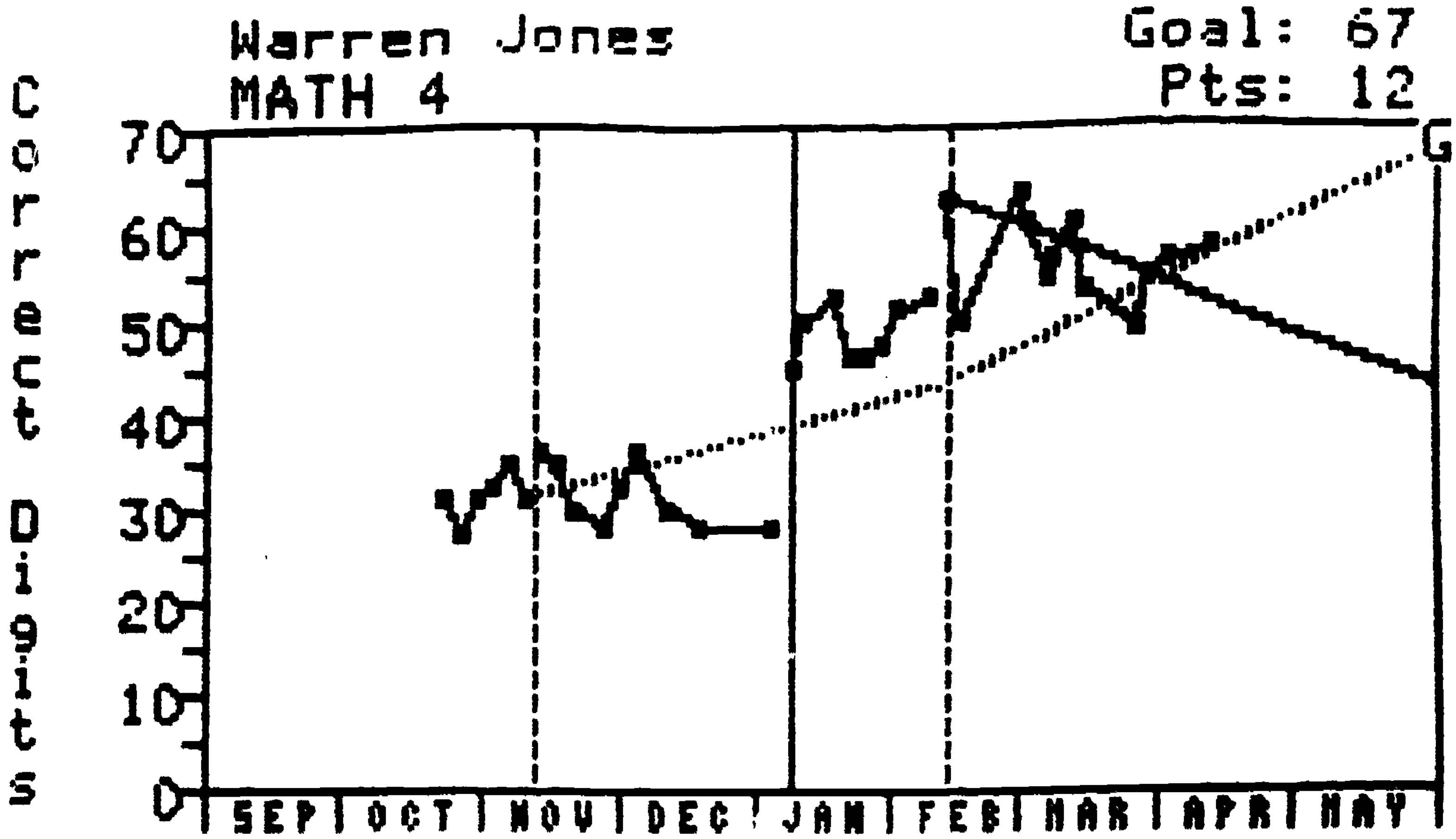
Figure 2. A sample CBM graph.

Figure 3. A skills analysis.

Figure 4. Flow chart of reintegration process. E = experimental (reintegration) student; C = control student in special education; LAP = low-achieving peers in regular math; CBM = curriculum-based measurement; IEP = individualized educational plan.

Figure 5. Progress of experimental and control/LAP students in special and regular education.


Regular Classroom
Regular Classroom with Consultative Assistance
Regular Classroom plus Part-Time Resource Room
Regular Classroom plus Part-Time Special Class
Full-Time Special Class
Full-Time Special Day School
Homebound Instruction
Hospital or
Residential
Placement



Uh-oh! Make a teaching change.

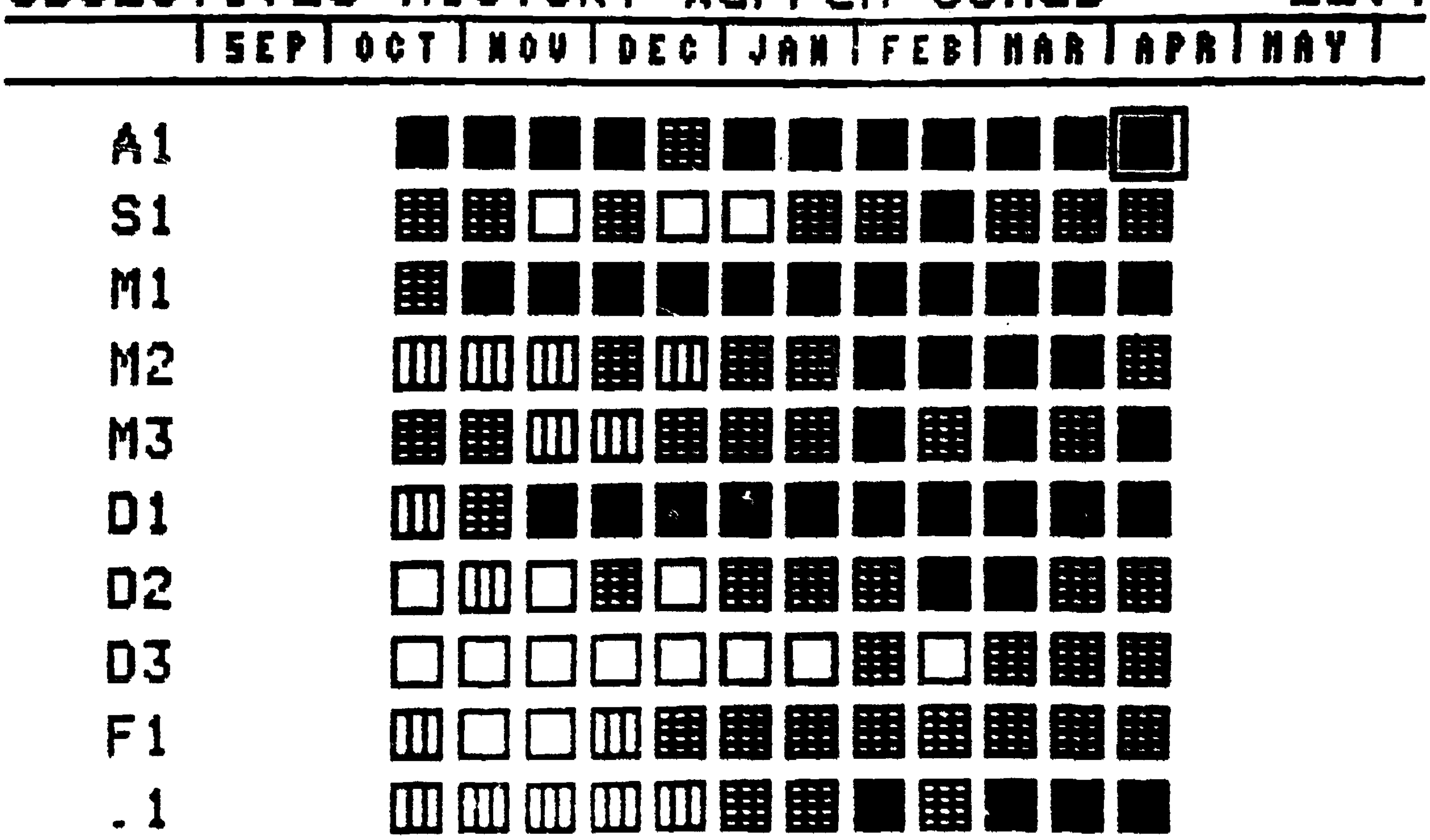
MASTERY STATUS FOR Warren Jones
APR 1-APR 15 (2 probes)

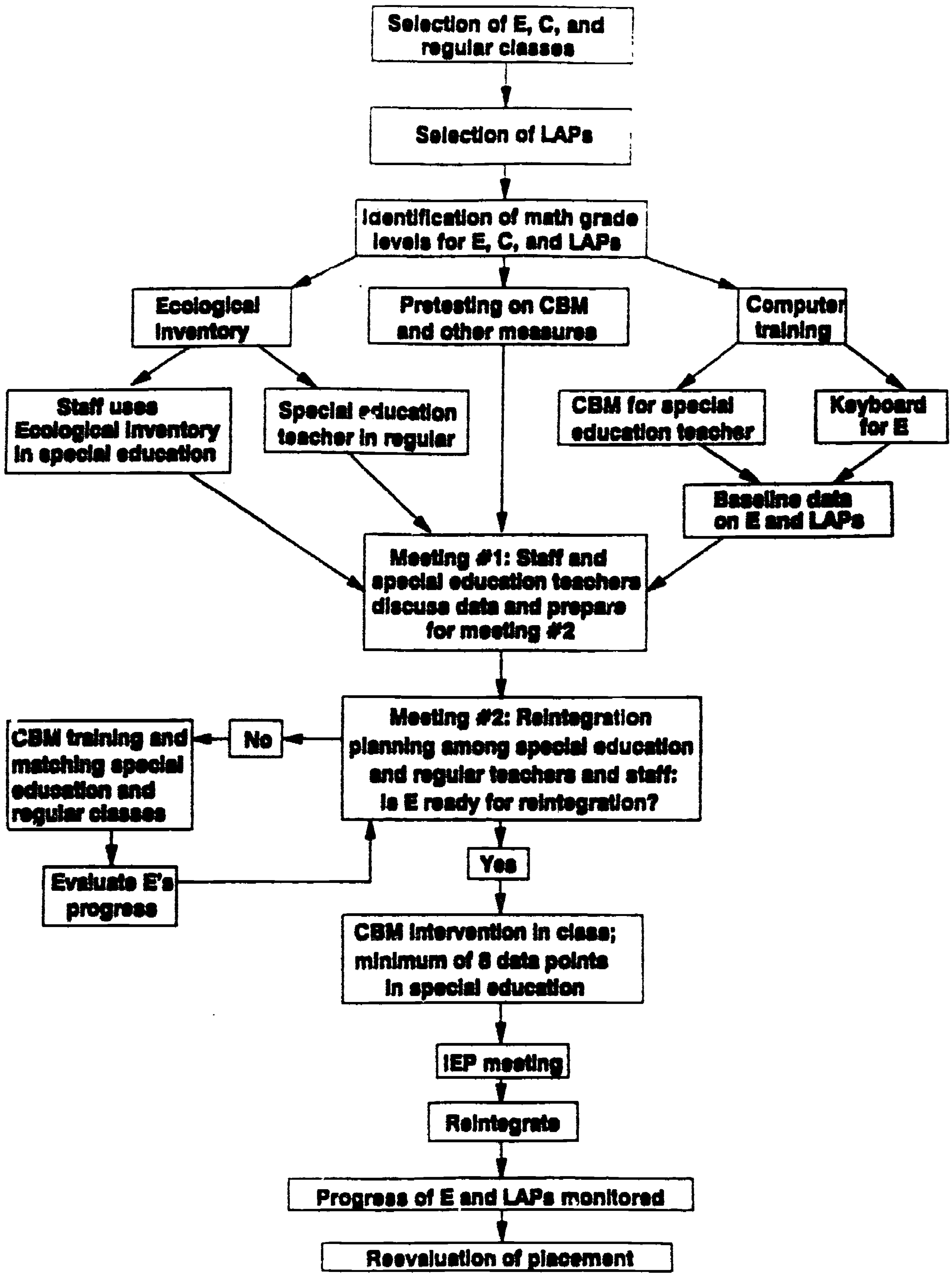
		Attempts	Accuracy
MASTERED			
A1	+ multidigit w/ regrouping	6/6	93%
M1	X basic facts, factors to 9	12/12	100%
M3	X by 1- or 2-digit w/ regrouping	6/6	100%
D1	- basic facts, divisors 6-9	8/8	100%
.1	+/- mixed decimals to hundredths	4/4	92%
PARTIALLY MASTERED			
S1	- two 4-digits w/ regrouping	2/2	83%
M2	X two 2-digits no regrouping	2/2	67%
D2	- 3- by 1-digit no remainder	2/2	60%
D3	- 2- or 3- by 1-digit w/ remainder	2/2	71%
F1	+/- simple or mixed no regrouping	6/6	56%

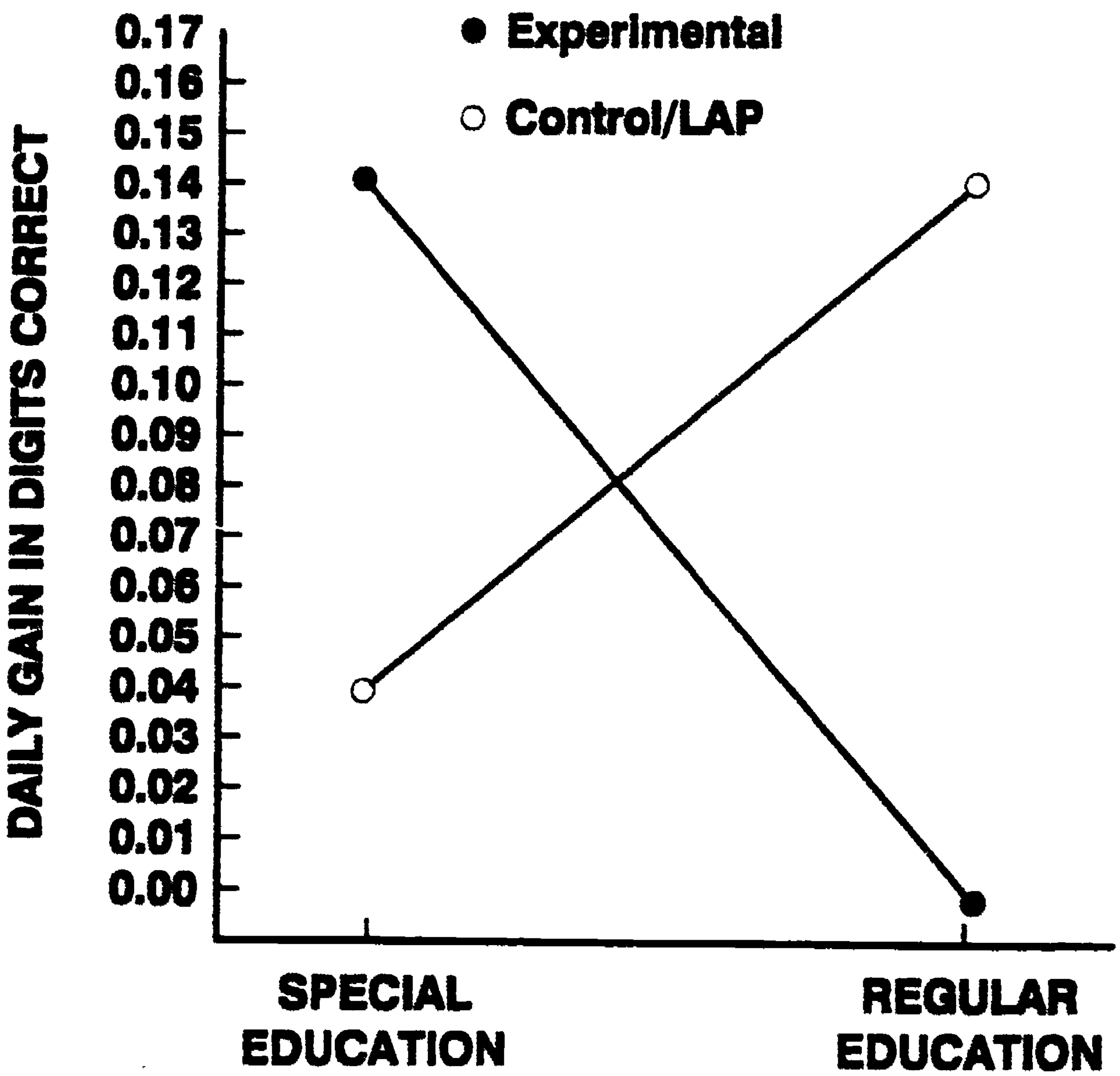
NONMASTERED

NOT ATTEMPTED

OBJECTIVES HISTORY Warren Jones LEV4




Selection of E, C, and regular classes
Selection of LAPs
Identification of math grade levels for E, C, and LAPs
Ecological inventory
Pretesting on CBM and other measures
Computer training
Staff uses Ecological inventory in special education
Special education teacher in regular
CBM for special education teacher
Keyboard for E
Baseline data on E and LAPs
Meeting #1: Staff and special education teachers discuss data and prepare for meeting #2
Meeting #2: Reintegration planning among special education and regular teachers and staff: Is E ready for reintegration?
No
CBM training and matching special education and regular classes
Evaluate E's progress
Yes
CBM intervention in class; minimum of 8 data points in special education
IEP meeting
Reintegrate
Progress of E and LAPs monitored
Reevaluation of placement



Experimental
Control/LAP
DAILY GAIN IN DIGITS CORRECT
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
SPECIAL EDUCATION
REGULAR EDUCATION