DOCUMENT RESUME

ED 372 491 EA 025 971

TITLE	Research Findings. National Education Commission on Time and Learning.
INSTITUTION	National Education Commission on Time and Learning, Washington, DC.
PUB DATE	Sep 93
NOTE	123p.;For a briefing paper, related hearings, and research findings, see EA 025 962-970.
PUB TYPE	Information Analyses (070)
EDRS PRICE	MF01/PC05 Plus Postage.
DESCRIPTORS	Compliance (Legal); Costs; Elementary Secondary Education; Extended School Day; Extended School Year; Incentives; Professional Development; School Schedules; *Time Factors (Learning); *Time Management; *Year Round Schools
IDENTIFIERS	*National Education Commission on Time and Learning

ABSTRACT

This paper summarizes findings of the National Education Commission on Time and Learning (NECT&L), which conducted a comprehensive review of the relationship between time and learning in elementary-secondary education. The first section highlights salient research findings. The following sections provide information on these topics: general thinking about time and learning; the length of the academic day and year; time for academic subjects; incentives and motivation; students' time outside of school; homework; the professional development of teachers; school facilities; a model for year-round education (YRE): costs and spending in education; and changes in laws and regulations regarding YRE. (Contains 191 references.) (LMI)

RESEARCH FINDINGS

NATIONAL EDUCATION COMMISSION ON TIME AND LEARNING

SEPTEMBER, 1993

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SCHOOL AND CLASSROOM ORGANIZATION:

Students have different learning rates and styles and need programs that differ in the amount of time made available to learn.

To achieve more equal learning outcomes, students must be treated unequally in terms of time to learn.

The amount of time provided significantly influences students' opportunity to learn.

Teachers tend to pace their classes to find a compromise between boring the fastest students and frustrating the slowest students. It is estimated that teachers allocate time and make decisions about when to shift topics based on the performance of students between the 25th and 50th percentile.

Most school organization is "batch processing" where pupils are sorted by age and move in equal time allotments (instructional periods) regardless of interest or performance. This approach does not pay homage to the diversity of the population being served.

When teachers stay with the same students for a number of years as they do in some elementary schools in the U.S. and other countries, there is much less down time.

LENGTH OF THE ACADEMIC DAY AND YEAR:

The total amount of time Japanese and Chinese children spend in school is greater than the time American children spend in school. However, Asian children spend an average of 50 minutes a day in recesses versus 10 minutes in American schools, and as much as an hour and a half is devoted to lunch, more than three times the amount allowed in most American schools.

The lack of a consistent relationship between the number of days or the number of hours of instruction and academic achievement suggests that the way in which time is used is crucial.

Most states require 175-180 days in the academic year. State policies vary on the length of the school day in hours by grade level.

INCREASING THE AMOUNT OF TIME FOR ACADEMIC LEARNING:

A study of Chapter 1 programs that increase the amount of time

students receive instruction in reading, mathematics and language arts found that increases in instructional time consistently produce increases in student achievement when staff use the time effectively. (The most recent draft paper on the reauthorization of the Elementary and Secondary Education Act notes that 1) only 9% of Chapter 1 programs provide extended learning opportunities through before-and-after-school programs and only 15% of the programs offer additonal time through summer school, and 2) most Chapter 1 programs only add an average of 10 minutes of extra instructional time a day. The legislation calls for schools which have not opted for a schoolwide approach to give primary consideration to extended time strategies.)

Setting curriculum standards for all students, not only in the traditional disciplines (math, language arts, science, and history), but now to include the arts, civics, geography and foreign languages, must be accompanied by a reconsideration of time allocation. This is is becoming clear as the new standards are emerging in the U.S. and is confirmed by the experience in Great Britain.

The processes involved in learning higher order thinking skills take a great deal of time, much more time than is typically allowed for the study of any topic in the school curriculum.

Because learning for understanding takes more time, choices will have to be made about what content to include or more time may be needed.

There is much that is not known about how to arrange learning experiences that will help students do their own knowledge building. This suggests that teachers will need more time to experiment and develop effective teaching strategies.

American children spend less time in elementary school actually engaged in academic activities than Chinese or Japanese students.

National governments in Asian schools specify not only the content to be taught, but also the amount of time to be spent.

There is wide agreement that the first 3-5 years of life have a profound impact on the social and intellectual development of children. Children who fail to develop adequate speech and language skills are six times as likely to experience reading problems in school.

The quality of pre-school undoubtedly shapes the readiness of a child for school. The Business Round Table reports that the evidence is very strong that a quality pre-school program for disadvantaged children can significantly reduce poor school performance.

Kindergarten teachers firmly support pre-school for 3-4 year-olds.

None of the different types of programs which provide students with an extra year to get ready for first grade demonstrate a lasting academic effect, apparently because there is inadequate long-term, continued support for students as they progress through school.

MAKING BETTER USE OF EXISTING TIME:

Time Use in General:

The actual amount of time mandated by state laws and district decisions is eroded by other priorities set by law and regulation at the state and local levels as well as a host of commonly found practices in schools including student absence, student lateness, early closings, late openings, bad weather, non-adherence to policies, teacher strikes, lack of school orderliness, student discipline/disruptions, interruptions (PA system, visitors), field trips, assemblies, classes that do not start on time, dead time when students finish an assignment and have nothing to do, lack of clear rules, lack of routines, lack of adequate direction from the teacher about assignments, pull out programs, extra-curricular programs, testing, instruction not appropriate to the learning level of the student, moving students to other rooms, extensive housekeeping chores, teacher decisions not to start a new topic at the end of a class period or school week, and a general lack of teacher knowledge of effective instructional and classroom management.

Syntheses of 2,575 studies of learning suggest that nine factors are powerful and consistent in influencing learning:

1) Amount of time students engage in learning;

2) Quality of the instructional experience including method and content;

3) Ability, or prior achievement;

4) Development as indexed by chronological age or stage of maturation;

5) Motivation or self-concept as indicated by personality tests or the student's willingness to persevere intensively on learning tasks;

6) "Curriculum of the home";

7) Morale of the classroom social group;

8) Peer group outside school; and

9) Minimum leisure-time television viewing.

A study of elementary schools that achieved higher test scores than predicted by their demographic characteristics found that effective schools make better use of time. They were higher in the proportion of on-task behavior, the amount and quality of student practice on presented material, and the proportion on time spent in interactive instruction. Teachers in the effective schools also rated better on clarity of presentations, high expectations of student success, orderliness in the classroom, and more effective classroom process.

The percent of time students spend engaged in learning in school is much less than the percent of time that teachers allocate to learning. The average daily academic engaged time is about 1 hour and 30 minutes in second grade and 1 hour and 55 minutes in the fifth grade. Students in classes with effective teachers are engaged about 30 minutes more than the average. Students in classes with the least effective teachers are engaged about 30 minutes below the average.

High achieving countries share one characteristic: a culture of learning. Unless the task of learning is valued, the teaching strategy may be irrelevant.

Despite the promise that technologies offer to schools, and despite encouraging developments in some places, its potential is not widely realized. Programming and computer literacy in secondary schools, and drill in basic skills, have dominated computer use in most schools.

Even under the best of circumstances, it takes a great deal of time for teachers to become comfortable with new technologies and fully incorporate them into their classroom curriculum. To the standard problems of initiating change in schools, technological innovation has the additional problems associated with technical complexity and expertise, an area which has heretofore been absent or treated only superficially in teacher pre-service and inservice education.

Approximately 500 teachers who reported that computers changed their classrooms indicated that technology 1) allowed them to expect more from their students (72%), 2) permitted them to spend more time with individual students (70%), 3) less time lecturing to the class (52%), and 4) less time with the whole class reviewing material.

Overall, students spend about 66% of their time doing seatwork during reading, and 75% of their time doing seatwork during math.

Variation in the amount of time individual teachers devote to

particular academic subjects (e.g. math, science) is much greater in American than Asian schools.

In contrast to the two day weekends and long summer vacations that characterize American schools, time flows more continuously in Chinese and Japanese schools.

Japanese teachers provide students with time to think. Each concept and skill is taught with great thoroughness, thereby eliminating the need to teach the concept again. Questions posed by Japanese teachers stimulate thought. These practices differ significantly from those used by American teachers who cover and re-cover large amounts of material and ask questions to get explicit answers.

Japanese and Chinese parents expect their children to learn social skills in nursery school and kindergarten.

Textbooks:

The later the copyright dates of textbooks for the same grade, the easier they are as measured by readability level, maturity level, difficulty of questions, and extent of illustrations.

A recent study of average and above average readers found that 78% to 88% of fifth and sixth graders could pass pretests on basal comprehension skills before they were covered in the basal reader.

The practice of schools buying only one textbook at "grade level" for all students pressures adoption committees to buy books that the least able students can read, sacrificing the more able students.

Textbooks are not developed to stimulate learning of new content. One study found that only 25 percent of the pages in typical 7th and 8th grade math texts contained new content, which translates into encountering new material less than once every one and a half days a week.

In contrast to American textbooks, Asian textbooks are slim, inexpensively produced, contain few illustrations, focus directly on the topic being learned, do not contain digressions into tangentially relevant information, and are not repetitious. Unlike American teachers who decide what to cover and what to skip in textbooks that contain more information than can be covered, Asian teachers cover all the topics presented in greater depth insuring that all students are exposed to the same content.

Nongraded Programs:

A nongraded program is one in which children are flexibly grouped according to performance level, not age, and proceed through school at their own learning rates. The curriculum is sometimes referred to as "continuous progress" or "developmentally appropriate."

Recently, the states of Kentucky, Oregon, and Mississippi have promoted a shift to non-graded primary schools, and some schools and districts elsewhere are moving in this direction.

One of the main rationales for nongrading is that it allows students to spend more time, if necessary, to reach a high level of performance or to spend less time if they are able to go more quickly than other students.

Gifted and Disadvantaged Students:

The large majority of gifted students in the country spend all but two or three hours per week in regular classrooms where only minor modifications are being made to challenge them.

The predominant use of heterogeneous grouping conflicts with the finding that homogeneous grouping produces academic gains for gifted students.

Instruction that emphasizes meaning and understanding (higher-order thinking skills) is more effective at inculcating advanced skills, is at least as effective at teaching basic skills, and engages children more extensively in academic learning. Yet most of the supplemental services targeted to particular students (Chapter 1, ESL services) provide extra practice in basic skills out of context and do not emphasize meaning and understanding.

In many schools, large numbers of disadvantaged students are not offered real challenges in advanced courses (e.g. algebra and geometry) and have few opportunities to experience rich instructional approaches that develop higher level skills.

Course-taking is clearly related to college success. The course that makes the most difference in college success for minority high school students is geometry. However, minority students actually enroll in geometry at less than half the rate of enrollments by white students.

Even after controlling for students' ability-group membership and prior math grades, eighth graders who take an algebra course achieve significantly better than do similar students who receive high, medium, or low content math survey courses.

A major problem with Chapter 1 is the continued use of pull-out

programs, which add only about 45 hours of instructional time to the students' school year. A study of 11 extended-time programs found that an average of about 56 hours of instructional time was added yearly (excluding one all-day kindergarten which added 450 hours of instruction for students). Thus, existing extended-time programs add nearly one-fourth more time than pull-out approaches However, it is unclear whether Chapter 1 studen actually do receive an increase in total instructional time. In pull-out programs, supplemental additional instruction is provided in a subject area by a Chapter 1 teacher. Students appear to be pulled out of regular classes where instruction for other students is occurring.

Not all extended-time programs have had formal evaluations, but those that do report benefits attributable to the additional time. These included Saturday classes, all-day kindergarten, before-school language-arts activities, hands-on after-school computer time, school-and home-based computer activities, and summer school. Some researchers have recommended extended time programs before or after school and summer work as ways to increase learning time.

Research studies of compensatory education have repeatedly found a "fadeout" effect - the cognitive learning gains achieved in the early grades quickly dissipate and eventually disappear entirely when there is no special program to follow through in the later grades on the initial investment.

The Family:

There are mixed findings regarding the relationship between mothers who work and student achievement. For example, studies have shown that maternal employment does not affect the educational progress of children, the number of years of schooling the children complete, or the child's development.

Research suggests that a stable, supportive adult network is important to parenting and child development. However, two-parent households are not always stable and supportive, and single-parent households are not always isolated and overwhelmed.

A study of young people from low-income black homes with varying family structures, found that the parents of high academic achievers set firm but not harsh rules, seek information about their children's academic progress, enhance literacy skills through activities such as reading and word games, and model an optimistic, assertive approach to life. The two-parent and single-parent families in the study that had these characteristics produced higher achieving students while the two-parent and single-parent families that lacked these characteristics produced less successful students.

Youth and Violence:

The intensity of violence involving children has escalated dramatically. At the Children's National Medical Center in Washington, DC, the rate of penetrating trauma (bullet or stabbing wounds) has increased by 1,740% since 1986.

The American Psychological Association Commission on Violence and Youth reports that there are 5-6 violent acts per hour on television during prime time; there are 20-25 per hour on Saturday morning children's programs. Ninety-eight percent of American homes have at least one television which is watched each week an average of 28 hours by 2-11 year olds and 23 hours for teenagers. Low income children are the heaviest viewers. Higher levels of viewing violence on Television contributes to increased acceptance of aggressive attitudes and behavior.

Aggressive and disruptive classroom behavior contributes to poor school achievement and peer relations which makes later antisocial behavior more likely. School-based interventions can improve students' social behavior and reduce at-risk behavior among youth not seriously violence-prone by teaching them how to cope with crises and offer problem-solving skills and anger management.

STUDENT MOTIVATION:

A number of cognitive researchers argue that an educational program which encourages students to challenge ideas and think is more intrinsically motivating than a program which requires them to memorize discrete facts.

Psychological research shows that life's greatest pleasures include the development of skills and absorption in constructive activities. Such experiences are more often encountered in work than in leisure; and high school students encounter them most frequently when opportunities sufficiently challenge their skills both in school and outside pursuits.

Many teachers are in conflict about setting higher expectations for low-achieving students. They seek to reconcile the added student effort that higher expectations require with their concern that disadvantaged and low-ability students may be excessively burdened.

Sympathy offered to students when they fail, praise offered for modest accomplishments, and help given when it is not requested, are perceived by students as signs that they lack ability.

In a study of ten countries, researchers conclude that children who come from homes where learning is expected and supported do well in any of the school systems.

Asian cultures use three strategies to socialize students and motivate them:

1) They find people who exemplify the ideals held by the society and select aspects of their lives that can be described simply and dramatically. The descriptions are consistent and repeated frequently, so that the characteristics are well known. Earlier in this century, such models existed in this country and every American student was aware of the inventiveness of Ben Franklin, the compassion of Florence Nightingale, the hard work or honesty of Abe Lincoln. For the most part such cultural models in the U.S. have been replaced by sports figures and entertainers. New models emerge because of their hairstyles, dance techniques, material possessions, dress etc. No conscious national effort has been made to develop such models in the U.S.

2) Group identification is used to heighten children's motivation toward particular goals. In Asian classrooms, teachers ask students to generate their own solutions and call on other students to evaluate the accuracy or relevance of the answers. The Asian student who has not studied faces the disapproval of his or her peers. In the U.S., teachers lecture and are more likely to assume responsibility for the students' learning.

3) Rather than expecting children to be able to demonstrate a particular form of behavior spontaneously, Asian teachers explicitly teach the component skills that are necessary for smooth operation of the classroom.

OUT OF SCHOOL TIME:

The Need for Alternatives:

There are vast inequities in the availability of out-of-school programs for youth. Existing programs for early adolescents tend to serve young people from more advantaged families.

Existing before-and-after-school programs serve a small percentage of children (12%) aged 5-13 from families receiving public assistance.

For 15 years, funding for recreation services has steadily declined. Publicly supported recreation programs are evolving into a two-tier system, with more and better services available in suburban areas than in less affluent rural and urban areas. The current fiscal cutbacks are serving to increase the disparity between upper and lower income areas, meaning that youth most dependent on public recreation services are increasingly less

likely to have them.

The National Association of Elementary School Principals reported in 1988 that 84% of responding principals said that children in their communities need increased access to organized before-and after-school programs.

Five surveys of employers of high school graduates conducted between 1983 and 1991 strongly point to the importance of the kinds of skills and attitudes often (though not exclusively) promoted through nonformal learning situations. For example, a Committee for Economic Development (1991) survey conducted by Louis Harris found that lack of dedication to work and discipline in work habits were the biggest deficits that employers saw in high school graduates. Other surveys of prospective employers echo the need for qualities such as "character", sense of responsibility, self-discipline, pride, teamwork, and enthusiasm. Researchers do not deny the importance of improved academic skills. They do argue that there is more to performance on the job than formal educational background.

Young people are beginning to use libraries as shelter. In many localities, libraries are used in the absence of supervised day care during non-school hours. Misuse of libraries is becoming more of a problem.

Sixty percent of adolescents' waking hours are committed to school, homework, eating, chores, or paid employment, while 40% of their time is discretionary.

A 1988 study found that 27% of eighth graders regularly spend two or more hours home alone after school. Eighth graders from families in the lowest socioeconomic group were more likely to spend more than 3 hours alone.

In 1990, American teenagers spent, on average, about 21 hours per week watching TV. They read for pleasure about 1.8 hours per week.

More than 17,000 organizations offer community-based youth programs, but many of these organizations are chronically underfinanced.

In 1991, religious congregations in the U.S. supported a large number of non-religious activities including education. Fifty-three percent of all congregations supported non-religious educational activities. Elementary education programs were offered by 27.2% of congregations; secondary education programs by 22.3% of programs.

Before-and-After-School-Programs Serving Children in Kindergarten through Grade 8:

In 1991, approximately 1.7 million children in kindergarten through grade 8 were enrolled in 49,000 formal before- and/or -after-school programs. Thirty-five percent of these children were enrolled in public school-based programs. Public schools actually sponsor (operate) 18% of the total number of programs.

Approximately 71% of the 1.7 million children enrolled attend programs that meet both before and after school; the remaining 29% attend programs meeting only after school.

The 1.7 million children enrolled in before-and/or-after-school programs are overwhelmingly in pre-kindergarten through grade 3: 90% of the before-school enrollments and 83% of the after-school enrollments are in this age range.

Most states have little information about the numbers of programs in their boundaries or the number of students attending them. All but 11 states exempt public school-run programs from licensing.

Before-and-after-school programs report many purposes including the provision of adult supervision and a safe environment for children, recreation, cultural and enrichment activities, the prevention of social problems, and the improvement of academic skills. Almost half of the programs provide remedial help to children having difficulty in school.

Activities provided on a daily basis most often include time for homework, games, reading, physically active play, block building, and free time. Activities offered at least weekly by 70% of the programs include creative arts/crafts, dramatic play, dance, music, and storytelling. Other activities include formal counseling/therapy (57% of all programs), computer games (54%), television viewing (49%), team sports (46%), skill-building sports such as track/field (44%), or tutoring (35%).

The average hourly fee for combined before-and-after-school sessions is $1.77. Most parents (86%) pay the full fee for enrolling their children in the programs. A third of the programs sometimes adjust parental fees based on income.

Chapter 1 funds are currently being used by only 3% of the programs nationally and only 4% of the programs that serve children from lower-income families.

Youth Employment:

National surveys indicate that approximately two-thirds of all high school juniors and seniors hold jobs in the formal part-time labor force and that over half of all employed U.S. seniors work more than 20 hours a week.

Many studies of part-time employment during adolescence have shown that work in excess of twenty hours a week during the school year is associated with lower academic achievement and school involvement, more delinquency, and substance abuse.

International Comparisons of Out-of-School-Time:

In a study of eleventh graders in the U.S., Japan and China, the amount of time spent studying was significantly related to students' test scores on mathematics tests in all three countries and to scores in both mathematics and reading in China and Japan. Furthermore, academic achievement declined in all three cultures as the amount of time students spent working, watching TV, and being with friends increased.

While 80% of American teenagers hold part-time jobs, only 26% of the Chinese and 27% of the Japanese students work at jobs outside school. Nearly all of the Chinese and half of the Japanese students who work are enrolled in vocational high schools and work in jobs closely related to the area in which they are receiving vocational training.

American teenagers spend about 80% more time with their friends than they do studying; an average of over 18 hours a week versus 10 hours. The relative emphases are reversed for Chinese adolescents, who spend nearly twice as much time studying as they do socializing with friends. Japanese students engage in both types of activities for nearly equal amounts of time.

One study found 37% of Chinese students enrolled in after-school academic classes; 21% of Japanese students enrolled in Juku, and 7% of Minneapolis students enrolled in after-school academic classes.

Although some Japanese colleges consider participation in extracurricular activities in their decisions about admission, the more prestigious universities are less likely to do so.

Japanese and Chinese adolescents spend less time and money going to dances, parties, movies, concerts and sporting events than their American counterparts. Japanese and Chinese students were more likely to spend time with their friends studying or simply "hanging out". Students estimated the following amounts of money they had available each month from their jobs and allowances: Americans: $203; Japanese: $90; Chinese: $85.

There is strong communication between Asian parents and teachers. Elementary students each carry a small notebook between home and school. A parent must indicate in the notebook that the child has completed the homework and may write about any general problems of which the teacher should be aware.

HOMEWORK:

The National Assessment of Educational Progress (NAEP) reports the amount of time students spent doing homework in 1990. At age 9, 82% of students reported doing one hour or less of homework a day: at age 13, 58% of students reported doing one hour or less; at age 17, 51% of students report doing an hour or less of homework a day.

Homework's effectiveness is influenced by a number of factors that rarely have been examined by researchers. These include the effects of student motivation, the effects of study skills, the question of whether some students need more time than others for homework, the relative effectiveness of alternative strategies for more closely integrating homework into classroom instruction, the relative benefit of homework as individual or group projects, the importance of providing materials necessary to carry out assignments, and the effects of physical surroundings provided to the student doing homework.

Homework seems to be most effective when it is viewed as a positive out-of-school learning opportunity. This is the case when teachers 1) plan out-of-school learning that will expand and enrich the curriculum, rather than confining homework to more of the same, 2) use homework to provide opportunities for students to think critically about how some of the ideas learned in school apply to their lives out of school, 3) use homework to help students better understand their own backgrounds and life experiences, and 3) provide opportunities to involve parents and other family members.

In France and Japan, student motivation to do homework is fueled not only by the traditional importance assigned to homework, but also by the wish to be admitted to a particular track or a particular secondary school. While this particular incentive might be a problem for some people in the U.S., we should point out that Al Shanker continues to call for consequences related to student effort.

PROFESSIONAL DEVELOPMENT:

Estimates of time required to develop and implement school improvement plans, add up to time commitments of 10-20 teacher days per year.

Liberal arts courses, where teachers learn their content knowledge, teach facts and lower-level cognitive operations that do not provide teachers with the background they need to teach students higher order thinking.

Japanese elementary school teachers are in charge of classes only 60% of the time they are at school. Large amounts of non-teaching

time are available, because Japanese classes are larger, and Japanese teachers are at school longer each day than American teachers. The non-teaching time provides opportunities for teachers to plan effective lessons, provide individual assistance to students, and learn from colleagues.

There must be a clear understanding of the purposes for which the additional time is to be used by teachers and, if appropriate, teacher training in skills to make effective use of the additional time.

The Time Commission of the National Education Association concludes that time for collaboration, dialogue, and reflection among professionals is essential. The single most important and necessary resource for effective school improvement is time with colleagues.

SUMMARY OF RESEARCH FINDINGS

Opportunity to Learn:

John Carroll's model of learning, developed in the 1960's, still undergirds much thinking about time and learning (4, 5). Basically, **the model says that the learner will succeed in a given task to the extent that he spends the amount of time he needs to learn the task.** He identified "opportunity to learn" as a major factor in school learning. **Carroll defined opportunity to learn as the amount of time allowed for learning** and made the following points:

1) Schools can respond to the opportunity to learn in many different ways. They can ignore differences in students' learning rates and give all students the same amount of time to learn. They can use ability grouping and assign students to different groups on the basis of estimated learning time. They can allow each student to proceed at their own learning rate. **As schools are currently structured, opportunity to learn is less for large numbers of students than is required in view of the student's aptitude.**

2) **Opportunity to learn in terms of time made available affects both performance and motivation.** In heterogeneously grouped classes where the pace of instruction is rapid, only the apter students can keep up with instruction, while others fall back and sometimes never get caught up. In classes where the instruction is aimed at the slower student, many fast learners become unmotivated when they feel their time is being wasted. Not allowing enough time for slower students to achieve proficiency leaves them unprepared and unmotivated for the next task.

3) **The amount of material students are expected to cover affects the opportunity to learn, particularly if the school determines that more material should be covered than there is adequate time available.**

4) **Equality of opportunity to learn means providing appropriate opportunities to learn (appropriate, not necessarily equal for all students)**, and pushing all students' potential as far as possible toward their upper limits.

5) **Students have different learning rates and need programs that differ in the amount of time made**

available.

A given amount of time does not ensure achievement, but it does create an opportunity for achievement that may not be possible without it. Allocation of time for education is an important indication of the state's priority for education (157).

Time-Based Structures in Schools that Inhibit Learning:

By treating time (not learning) as the "constant" or controlling factor, schools become the barrier to improved learning as opposed to facilitators of learning. For example, putting students into grades (k-12) is a kind of "batch processing" arrangement where pupils are sorted by age and move in equal time allotments (instructional periods) regardless of interest or performance. As pupils in the "batches" experience difficulty, they are removed from the mainstream processing and given more doses of instruction (e.g.Chapter 1). In industry, this is called "reworking", which adds an enormous cost to the enterprise. Higher standards in the form of test scores increase pressures to learn more in the same time and within "batches" moving equally along a school. This in turn raises the "reworking" demands to keep everybody on track. The simple fact is that **for "batch processing" to reach any kind of optimal state, standardization of input is an absolute requirement. For the levels of human diversity present in schools, this is not possible** (127).

Schools are organized for teaching, not learning. While rigid schedules can be constructed for teaching, schedules for learning are far less predictable. Twenty years ago, U.S. education was concerned about breaking down the barriers that inhibit schools from being responsive to learning. "Flexible scheduling" was tried. However, it came to mean "unscheduled time" and was too open-ended as far as curricular options were concerned. It led to the cookbook curriculum of mini-courses and electives that now have been replaced by core curriculum. **The potential of flexible scheduling - providing units of time called "modules" tailored to actual pupil growth - was lost. Flexible scheduling is a tool that can deliver a core curriculum as easily as a conglomerate curriculum lacking focus** (127).

Teachers pace their classes to find a compromise between boring the fastest students and frustrating the slowest students. There is some evidence that teacher-pacing (timing) of learning produces less variability in learning rate between slower and faster learners than student self-pacing. **It is estimated that teachers allocate time and make decisions about when to shift topics based on the performance of students between the 25th and 50th percentile** (128).

It doesn't make much sense to group children according to their

chronological age and teach them as if they are a homogeneous group (159).

Age segregation (sequential grade levels and curricula), as practices in most large schools, is a relatively recent phenomenon, and one which runs counter to the pattern of upbringing of the young which previously existed for millions of years (160).

The structure of grades K-12 in U.S. schools inherently wastes time that would not be wasted if we instituted multiage grouping or continuous progress learning. Under the current system, students do not proceed at their own pace, and students who need more time to learn do not get it. **If the same group of teachers stayed with the same students for a number of years, as they do in some schools elementary schools in the U.S. and other countries, there would be no "down time"** at the start of each year when teachers are getting to know a new group of students. Nor is there pressure to rush through material to prepare the student for the next grade and teacher (156).

Teachers complain about "teaching to the test", but that is not the real issue since they normally teach to their own tests. The real issue is "which test does one teach to?" The test maker defines the curriculum. **When the test requires teachers to shift curriculum content around in their classrooms or teach or re-teach specific items, it radically alters the time left to do other things.** This is viewed as "intrusiveness" (127).

Different Time for Different Students:

A number of studies conducted mostly in the 1960's found significant differences in the amount of time it takes fast and slow learners to learn. Two studies found that it takes slow students 3 times as much time to learn as faster students. One study found that it took slow students 5 times as much time to learn as faster students. Three studies found that it took slower students 6 times as much time. Two studies found that the differences in the amount of time it takes faster and slower students to progress through curriculum increases as students work through the curriculum. Slower students fall further behind faster students, and, in one study, eventually required 10 times as much time as faster students (128).

Given the fact that students learn at different rates, the more we provide equality of time to students, the more we will obtain inequality of achievement; and the more we obtain equality of achievement, the more we will have to provide inequality of time to students. **If we want more equal outcomes, we must treat students unequally in terms of time to learn. A student who begins a learning sequence by performing poorly on the first step performs even more poorly on the second step because he lacks some of the**

prerequisites. Without extra time to restudy these prerequisites, he misses more prerequisites at each successive step. So the academically rich get richer, and the academically poor get poorer (128).

Schools need to get out of the lock-step 12 year system. The Commission should make some recommendations about the structure of student progression. For example, in Minnesota, students can complete high school early if they pass an exam. The money that is saved can be used for college tuition. This is a powerful incentive to learn a lot and learn fast (155).

Providing equal amounts of time to groups of students who need different amounts of time for learning may raise an equity issue - that is, the structure of the existing system may be inherently inequitable. When instruction is aimed to the middle of the class, some students have too much time and others have too little (155).

Quality of instruction, the management of the learning process by the teacher including appropriate sequencing and use of materials, influences the time that students need to learn. To the extent that quality of instruction is less than optimal, time needed for instruction is increased (4, 5).

The Purposes of Additional Time:

The concept of time must be defined and differentiated. It is simplistic and unproductive to think of time as one-dimensional, because time has different meanings in different situations. There are different kinds of time (e.g. allocated time, engaged time, time for teacher learning), and providing certain amounts of each kind of time can produce different results. Thought must be given to the purposes to be accomplished and the kind(s) of time needed to accomplish them (155).

Time use at the elementary, middle, and secondary levels should be differentiated. There may be some recommendations appropriate for all levels, while others would apply to only one (155).

If the Commission recommends a longer school day or year, it will be important to communicate that the additional time would lead to better utilization of the whole system. We would not simply be recommending more of the same at a higher cost (155).

The changing demographics, conditions, and needs of society provide both a responsibility and an opportunity to reconsider how time is used for learning (155).

Time, like money, is a scarce resource that can be spent in different ways. Time, unlike money, is allotted equally: everyone shares the same amount. Time use reflects priorities and

predilections, opportunities and constraints (34).

Time outside school is not "free" - it is the product of a set of opportunities and constraints (34).

Extended time programs fall on a continuum from those that provide primarily social (i.e. day care) services to those that provide primarily academic services (155).

Extended day programs with special purposes should not be confused with extended day programs having an academic purpose. The Commission should remember its academic focus (155).

Using What We Know about Time and Learning:

The time on task research tells us that a great deal of existing school time is not used for learning. Yet, this information has not caused enough changes in the way we do business (155).

Time and Cost Efficiency:

It would be a better social investment in the long run to give students what they need to be successful up front rather than trying to make up for deficiencies after the fact (155).

To avoid the tremendous costs of paying regular school teachers to teach for longer periods of time, it may be necessary to encourage a separation between the regular school day and additional time provided, much as has occurred in Murfreesboro. Alternatively, non-certified personnel could be used. If Chapter 1 funds were used in this way, students might receive more benefit (155).

Local financing of school programs, not to mention extended school programs, may be doomed to increasing levels of failure, because the political constituency is downsizing, That is the moral challenge this Commission and the country will have to face (155).

If you look at the costs of education in the U.S. and Japan, they are both approximately $5,000 per student. In this country, the push is to lower class size which results in teachers teaching more classes. In Japan, the classes are larger, but there are fewer of them (155).

LENGTH OF THE ACADEMIC YEAR AND DAY

THE CHARGE:

To conduct an analysis and make recommendations concerning the appropriate length of the academic day and academic year in elementary and secondary schools throughout the United States and in schools in other nations.

The Academic Day and Year in the U. S.

Most states require 175-180 days in the academic year. State policies vary on the length of the school day in hours by grade level. With minor exceptions, state requirements for the length of the school day at the elementary level range from 4 to 6 hours. At the junior high and high school level, state requirements also range from 4-6 hours, but overall, states with lower requirements tend to increase their requirements in higher grade levels (104).

The Academic Day and Year in Other Countries:

Note: Malcolm Skillbeck has agreed to incorporate "time and learning" questions into surveys underway.

In a study of ten countries (Canada, Britain, Israel, France, New Zealand, South Korea, Germany, Taiwan and Japan), researchers conclude that **the U.S. is below average in the length of the school year** with a range of 174 in France to 240 in Japan (82).

The total amount of time Japanese and Chinese children spend in school is greater than the time American children spend in school. Asian children spend 240 days in school each year while American spend 180 days per year in school. Asian children from the second grade on are at school more than 8 hours every weekday and return to school on Saturday. American children are at school approximately 6 hours each weekday. American children spend about half of the days each year in school; Asian children spend two-thirds. Chinese children finish sixth grade having spent the equivalent of one to two years longer **total time** in elementary school than American children. (1)

Internationally, there is not a simple, straightforward relationship between the number of days students spend in school in other nations and academic achievement. For example, International Association for the Evaluation of Educational Achievement (IEA) analyses place the U.S. 14th in academic achievement among 20 countries. Two of the 13 countries performing better than the U.S. academically have shorter school years and 5 of the 6 countries

performing worse academically have longer school years (105).

One study of time use (102) found that **children in Japan spend much more time in school, much more time studying, and have much less free time than students in the U.S.** The chart which follows summarizes the number of hours per week spent in the various activities by children at different stages of schooling. "Free time" refers to time not used for school, studying, reading, TV, sleeping, eating, personal care, playing games or sports, household chores or work outside the home.

	Primary	Junior H.S.	Senior H.S.
Time in school			
U.S.	25.2	28.7	26.2
Japan	38.2	46.6	41.5
Time spent studying			
U.S.	1.8	3.2	3.8
Japan	8.3	16.2	19.0
Free time			
U.S.	23.2	27.6	31.7
Japan	7.1	6.4	8.7

RESEARCH-BASED OBSERVATIONS:

Recently **Britain made a major effort to set a national curriculum in place. The curriculum made unprecedented time demands on schools, students, and teachers. The resulting public outcry led the government, not to extend the school day or year, but to reduce the curriculum requirements.** The moral of the story is that standards setting cannot proceed independently of time analysis (81).

Three years ago France decided to extend the length of school terms. However, in doing so, it neglected the interests of the tourist industry. **The longer school terms interfered with family skiing vacations, and the government eventually had to give way** (81).

Japan plans eventually to eliminate all Saturdays from the school schedule (81).

TIME FOR ACADEMIC SUBJECTS

THE CHARGE:

To conduct an analysis and make recommendations concerning the time children spend in school learning academic subjects such as English, mathematics, science, history, and geography.

Note: Recommendations about how much time students should spend in school learning academic subjects could involve Commission statements on better uses of existing time for learning and/or the need for additional time. There is a basis in research for recommending both, but far more support for better use of existing time.

This section summarizes 1) research findings related to increasing the amount of time for academic learning, 2) findings related to better use of existing time, and 3) findings that support both options. Research based observations follow these general categories.

RESEARCH FINDINGS RELATED TO INCREASING THE AMOUNT OF TIME FOR ACADEMIC LEARNING

General Findings:

During the first 18 years of life, American students spend only about 13% of their waking hours in school, which amounts to only about half of an adult work year (171).

A review of how collective bargaining agreements affected time allotments in a school day found that lengthening the school day increased other categories faster than it increased instructional time. Researchers concluded that adding 94 minutes to a school day would increase instructional time only 26 minutes, but preparation time would go up 27, clerical duties up 19, extracurricular up 14, and meeting with parents up 8 minutes (171).

A study of Chapter 1 programs that increase the amount of time students receive instruction in reading, mathematics and language arts found that increases in instructional time will consistently produce increases in student achievement when staff use the time effectively. Increases in instructional time may be especially beneficial for low achieving students, who may require more time to master specific skills or acquire the thinking skills necessary to

function effectively in the regular classroom (10).

Internationally, there is not a simple, straightforward relationship between the number of hours of academic instruction and academic achievement. For example, International Assessment of Educational Progress (IEA) analyses place the U.S. 13th in academic achievement among the 16 countries surveyed. Eleven of the 12 countries that performed better academically than the U.S. have shorter school days (106). Similarly, IEA analyses which place the U.S. 14th in academic achievement show that **11 of the 13 countries that perform better in mathematics have fewer hours of mathematics instruction each year** (105).

Variation in the amount of time an academic subject is taught is much greater in American than Asian schools. For example, in Minneapolis elementary classrooms, in 20 randomly selected hours of observation, some teachers were observed teaching mathematics as much as 40% of the time; several others never taught mathematics (1).

Although Asian children spend more time at school than American children, the difference in the amount of academic instruction is not so profound as the general statistics imply. The estimate of 240 days includes Saturdays, when Asian children are in school only a half day. This reduces the number of days in the Asian school year by the equivalent of 20 days, from a total of 240 days to a total of 220 days. In addition, Asian children spend an average of 50 minutes per day in recesses versus 10 minutes in American schools. As much as an hour and a half is devoted to lunch - more than three times what is allowed in most American schools (1).

Some Japanese and Chinese elementary students attend academically oriented cram schools. **In Japan 16% of first-graders and 46% of fifth-graders attend "juku", but few of them study academic subjects.** Japanese children tended to study English or the operation of the abacus, and only 10% of fifth-graders study mathematics. In China, only 2% of first-graders and 14% of fifth-graders attended such classes (1).

The national government in Asian schools specifies not only the content to be taught but also the amount of time to be spent. In China, for example, children attend classes 34 hours a week in grades one through six. During this time, reading is to occupy a minimum of 10 hours; mathematics, 6 hours; natural science, from 2-3 hours; arts and music, 2 hours each; physical education, from 2-3 hours; and moral education, 1 hour (1).

Asian elementary students receive much more instruction from teachers than American students. In China, the teacher is the leader of the child's activity 90% of the time, as opposed to 74% of the time in Japan and only 46% of the time in the U.S. (1).

American children spend the least amount of time actually engaged in academic activities in academic classes: 70% of the time in first grade, followed by a decline to 65% in fifth grade. Chinese students spend 85% of the time in first grade and 92% of the time in fifth grade academic classes actually engaged in academic activities. Japanese students spend 79% to 87% respectively (1).

Beginning School Earlier in Life:

Note: Three types of kindergarten "programs" that provide an additional year of time for students are: 1) developmental kindergarten, which places students into programs prior to regular kindergarten, 2) retention in kindergarten, and 3) transitional first grade, which provides an additional year of time in school before students enter a regular first grade classroom. All three programs are based on the philosophy that some children are not ready for school and need more time to get ready to develop behaviorally or cognitively.

There is wide agreement that **the first 3-5 years of life have a profound impact on the social and intellectual development of children** (189). Children who fail to develop adequate speech and language skills are six times as likely to experience reading problems in school (190).

There is **strong evidence supporting the link between infant health and cognitive development** in children 188).

Research (107, 172, 173) indicates that **none of the programs which provide students with an extra year to get ready for first grade have a lasting academic effect. The positive effects fade away after grade 1, and research indicates that these programs are no more effective than simply promoting the students. They do not outgrow their academic problems by buying a year. Researchers recommend long-term, continued intervention and supportive help to progress through school.**

Full day kindergarten programs as compared to half day programs have been found to increase readiness into the first and second grades, but these positive effects on academic achievement later wash out (172, 191). Lengthening the school day provides more opportunities for learning, but **the quality of the experience is the critical issue.** Some half-day kindergartens provide more high-quality time than full-day programs (191).

The well known Perry Pre-School Project, which provided approximately 12 hours a week of preschool education to disadvantaged black children in Ypsilanti, Michigan, documented increased graduation rates, lower rates of placement in special

education and less delinquency. However, **the impact of the Perry Preschool Program was very small and borderline in significance. Ten similar programs showed no positive effects** (171).

The most visible pre-school program is Head Start, which was launched in 1965 and has served more than 10 million children. Evaluations of Head Start's effectiveness in producing cognitive gains are mixed, with positive effects disappearing by the second or third grade (perhaps because there is no sustained support of the kind Head Start provides). Some lasting positive effects have been found on the social and emotional development of children in the program (188).

Other pre-school approaches (e.g. High/Scope and Academic Pre-School) have immediate cognitive effects, but the effects disappear by the end of the early elementary school years (188).

The quality of pre-school undoubtedly shapes the readiness of a child for school. The Business Round Table reports that the evidence is very strong that a quality pre-school program for disadvantaged children can significantly reduce poor school performance (190).

Kindergarten teachers firmly support pre-school for 3-4 year-olds (190)

A noted researcher concluded: **Since effective instructional programs in elementary and secondary school can produce much greater increases in student achievement, both the immediate and long-term effects of preschool programs on later achievement are unimpressive. The research provides little support for preschool programs as the answer.** Many of the evaluations of the programs are badly flawed and carried out by program administrators and advocates (171).

RESEARCH FINDINGS RELATED TO BETTER USE OF EXITING TIME

General Findings:

Individual schools differ in the quality of their use of existing time. The actual amount of time mandated by state laws and district decisions is eroded by a wide range of factors including student absence, student lateness, early closings, late openings, bad weather, non-adherence to policies, teacher strikes, lack of school orderliness, student discipline/disruptions, interruptions (PA system, visitors), field trips, assemblies, classes that do not start on time, dead time when students finish an assignment and have nothing to do, lack of clear rules, lack of routines, lack of adequate direction from the teacher about assignments, pull out

programs, extra-curricular programs, testing, instruction not appropriate to the learning level of the student, moving students to other rooms, extensive housekeeping chores, teacher decisions not to start a new topic at the end of a class period or school week, and a general lack of teacher knowledge of effective instructional and classroom management (129).

A review of studies that examined how time is used in classrooms found that **time is not used effectively.** For example, one study of grade 3, 5, and 7 mathematics classrooms found that the major activity was seatwork; a study of fourth grade mathematics classes found that 47% of the time students spent working alone (171). A study of grades 1-5 found that teaching to the group occurred about 22% of the time; teaching individuals 8.7%; directing activities 16%; general management 17%, waiting 20% and other non-instructional activities made up 15%. Another study showed that **classrooms with the lowest gains in achievement were places where students spent long hours on written assignments or silent reading, with little direct input from teachers.** Another study showed that direct instruction was more effective than individualized instruction in the primary grades (171).

A study of elementary schools that achieved higher test scores than predicted by their demographic characteristics found that **effective schools make better use of time. They were higher in the proportion of on-task behavior, the amount and quality of student practice on presented material, and the proportion on time spent in interactive instruction. Teachers in the effective schools also rated better on clarity of presentations, high expectations of student success, orderliness in the classroom, and more effective classroom process** (171).

A survey by the Missouri Association of Secondary School Principals (MASSP) (138) found the following activities were taking the most time away from classroom work: instrumental and vocal music, Future Farmers of America, boys and girls track and golf, softball and baseball, Future Homemakers of America, and speech and debate. **Students were missing as much as 7 days of school time due to extracurricular activities.** Some time also is lost on fund raising for the activities. **Time lost to extracurricular activities has become "a universal complaint".** The principals urged local school boards to review their policies to reduce time lost. Specific recommendations made by the principals included the following:

1) schedule special activity days in the spring, outside the regular school calendar, when many events could take place simultaneously;

2) create a summer sports season for baseball, softball, golf and tennis;

3) schedule "dead weeks" with no activities at the end of

semesters when tests are taking place; and

4) reduce basketball schedules and limit travel times for basketball games.

In mastery learning studies conducted during the 1970's, there is evidence that a particular amount of time and help at an early stage in the learning sequence has a different effect than an equal amount of time at a later stage in the process. **Giving students the opportunity to master skills or knowledge as they go along is more productive than waiting until some point down the road when the gaps in students' prerequisite skills and knowledge are many.** In addition, as students reach adequate levels of achievement over the preceding tasks, their confidence and interest in the task increase. If they do not reach such levels of achievement they become frustrated and develop some dislike for the subject (131).

A study of 82 teachers in 12 schools in Tennessee found that **teachers used between 26% and 35% of their time for direct instruction, defined as teaching and supervising seatwork.** Between 24% and 44% of teachers time was used for non-instructional duties (e.g. clerical work, supervising students in the lunch room). Interruptions accounted for 4% of teacher time. Talking with other teachers and students about topics unrelated to school consumed 10.5% of the time and activities such as daydreaming consumed approximately 6% of the time (145).

"The Effective Use of Time Program", which was first nationally validated through the National Diffusion Network in 1985, has demonstrated that **all types of schools (urban, rural, suburban; wealthy and poor; in all regions of the country) can increase the amount of time students spend in appropriate learning tasks.** The program translates research conducted on time and learning into a semester long training program for teachers in grades 2-12. The basic process used is as follows: 1) trainers observe teachers and prepare individual profiles of teaching behavior, 2) trainers provide research findings on effective instructional practice to teachers and help them to adapt the research to their own context and style, 3) other teachers (peers) assess changes and provide feedback as teacher trainees continue to work on their skills, 4) trainers observe teachers again and develop a second profile of teaching behavior, and 5) teachers trainees analyze their own profiles and set goals for improvement. The program has been shown to increase the amount of time students spend actively engaged in learning 5% in Vermont and Texas schools, 8% in Missouri schools and nearly 12% in Oregon schools. An increase of 12% in student engaged behavior in a 60 minute class period equals approximately 7 minutes. A 7 minute increase in 180 school days equals 21 additional hours. Twenty-one hours equals 4 weeks of additional learning time per year per one hour class period (132).

Analyses of research studies consistently find that spaced practice

over several lessons or study periods interspersed with other activities is superior to equal amounts of time spent in "massed", concentrated practice for long-term learning. Two spaced presentations are about twice as effective as two successive massed presentations (19).

To save time, what is important is not what teachers do to stop misbehavior, but how they prevent problems in the first place. Studies have shown that the way in which the year is started is crucial in both elementary and secondary classrooms. **Time is used effectively when teachers plan classroom rules in advance, communicate their expectations clearly, establish routines and procedures, systematically monitor student achievement, and provide feedback about academic performance and behavior** (137).

Better Use of Time: What Administrators Say:

The literature about what school administrators can do is primarily in the form of testimonials from administrators who have tried to improve time use. They suggest that **both principals and school superintendents need to be aware of the importance of using time effectively, understand how schools waste time, conduct studies to determine how time is currently being used, develop clear priorities for what students should learn, establish policies that are consistent with priorities, provide training for teachers in how to use practices that improve the use of time, monitor time use, and make changes as needed. The consensus seems to be that time use will not improve unless everyone in the school system works to improve it** (127, 130).

Better Use of Time: What Teachers Say:

Note: There are few recent articles written by teachers about using time effectively. In most of the articles, the teachers quote research findings and then describe how the findings work in their classrooms. Basically, they are examples of teachers who are using research findings to think about and improve their instruction. **The ways in which teachers describe using time effectively fall into two categories. Either they try to reduce interruptions and prevent students from sitting around and waiting, or they try to use sound, research based teaching strategies.** Examples are provided below:

Two mathematics **teachers begin class promptly by creating routines** where they either have problems written on the board or hand out printed sheets with a few problems for students to begin as soon as they enter the room (139, 140).

Two teachers of first and second grade children find that time is saved and learning promoted at the primary level in the following

ways:

1) Do not assume that primary grade children have short attention spans and plan frequent changes in activities. They argue: "If we continually make decisions for children based on scheduled times rather than on completion of tasks, we discourage growth in attention span. Instead **we should provide children with large blocks of time to engage in meaningful activities and projects, and eliminate routines that interrupt the child's work** "(p. 48).

2) Establish routines so the teacher does not have to continually tell students what to do next. **Students should be able to move from one learning activity to another with minimal direction from the teacher and little disruption to the flow of daily learning.**

3) Recognize that children learn in different ways and **provide a variety of learning areas in the classroom** as well as the opportunity to make choices. This encourages children to assume responsibility for their own learning, and increases the amount of time students are actively involved in learning (141).

One teacher combines science, math, and language arts instruction because it is "practical and efficient and is the only way to steal big chunks of time" (142, p.8).

A teaching assistant in a reading clinic (143) observed poor readers in elementary and junior high classrooms over a 5 month period and found:

1) **Teachers allow poor readers to spend an alarming amount of time in unproductive ways. Some of the practices he regularly observed included allowing students to take large amounts of time to move from one activity to another, permitting 5-10 minutes to pass before starting a lesson after students were seated in their groups, having students begin reading without setting the stage for the story, having a student stumble along reading out loud while other students tried to follow along becoming more and more bored, having students who finished their work before others in the class to sit and wait idly until everyone was finished, and straying away from the focus of the text being read in classroom discussions.**

2) Some teachers did not waste time, because they were organized. Practices he observed included teacher established and student understood routines and expectations for quickly and quietly moving from one

activity to another, having questions about the stories being read prepared and ready for students who finished stories early, direct instruction (telling students what they will be doing, why they will be doing it, how to do it), teacher guided application of skills, giving students increased responsibility, and thinking out loud to model the thinking process used to analyze a story.

Better Use of Time: What Others Say:

A professor of education at Teachers College, Columbia University who has observed New York city schools notes: Despite the eagerness of teachers and students in September, **the first sustained period of schooling often takes place between Halloween and Thanksgiving. Much of December is taken up anticipating the Christmas to New Year's vacation. There are two, at most three, weeks after Thanksgiving before things start slowing again. Skipping ahead, only a few weeks remain after the break for Easter and Passover before the weather begins to warm, and students start to leave. Teachers anticipate the end of the school year long before it has arrived, and expect learning to taper off from the beginning of May.** Some of his suggestions for making a stronger school year include:

1) Keep schools open for more of the non-Federal secular and religious holidays, and give students and teachers a choice of holidays they wish to observe, and

2) Schedule promotions to higher grades, and the beginning of the school year, for late spring, rather than fall - giving the excitement of a fresh start to teachers and students (144).

Time on Task Research:

The Beginning Teacher Evaluation Study (BTES), published in 1980 is the classic study of time on task. The study looked at time use of average ability, second and fifth grade students. Major findings include the following (133):

1) At the second grade level approximately 57% of the time is allocated to academic activities (reading, math, science and social studies); 24% to nonacademic activities (music, art, story time, sharing); and 19% to non-instructional activities (transitions, waiting). Fifth grade students spend 60% of their time in academic activities, 23% in nonacademic activities and 17% in non-instructional activities.

2) The percent of time students spend engaged in learning is much less the percent of time that teachers allocate to learning. The average daily academic engaged minutes is about 1 hour and 30 minutes in second grade and 1 hour and 55 minutes in the fifth grade. Students in classes with effective teachers were engaged about 30 minutes more than the average. Students in classes with the least effective students were engages about 30 minutes below the average.

3) Overall, students spend about 66% of their time doing seatwork during reading, and 75% of their time during math. Overall, the student engagement rate was 84% during teacher-led groups and about 70% when doing seatwork.

Engagement rates vary greatly between classrooms and from student to student, resulting in losses of class time from 10% to 50%. Engagement rates decline significantly during seatwork (171).

Karweit reviews studies of time on task and recommends that the findings from the BTES study be used cautiously. For example, in her analysis of time on task studies, when the ability level of the student was controlled, engagement in learning was found to explain only between 1% and 10% of the variation in student achievement. Karweit argues that it would probably be helpful to encourage teachers to minimize time wasted and to try to increase student engagement. However, since the existing studies indicate that time on task is weakly associated with learning after student ability level is factored out, we should be looking at an explanation of learning based on student differences in readiness to learn, rate of learning, and the quality of instruction. Paying perfect attention to a poorly organized or incorrect exposition on a topic is not useful. Engagement and appropriate instruction must simultaneously occur before learning can take place (135).

Merely initiating classroom management strategies which increase the percentage of engaged time is not enough if that time is not productive in terms of the opportunities provided for student learning. For instance, students who are actively engaged and who consistently incur errors or who continually grope over material that is too difficult for them, will not learn (134).

Time Waste inherent in Textbooks:

Textbooks are sorely lacking in rigor (23). A recent study of average and above average readers found that 78% to 88% of fifth and sixth graders could pass pretests on basal comprehension skills before they were covered in the basal reader (14).

Researchers have found that the later the copyright dates of

textbooks for the same grade, the easier they are as measured by readability level, maturity level, difficulty of questions, and extent of illustrations (22).

The practice of schools buying only one textbook at "grade level" for all students pressures adoption committees to buy books that the least able students can read, sacrificing the more able students (24).

Textbooks are not developed to stimulate learning of new content. One study (25) found that only 25 percent of the pages in typical 7th and 8th grade math texts contained new content, which translates into encountering new material less than once every one and a half days a week. Another study (26) found that students in grades 2-5 encountered between 40 and 65 percent new content depending on the textbook used.

In contrast to American textbooks, Asian textbooks are slim, inexpensively produced, contain few illustrations, focus directly on the topic being learned, do not contain digressions into tangentially relevant information, and are not repetitious. Unlike American teachers who decide what to cover and what to skip in textbooks that contain more information that can be covered, Asian teachers cover all the topics presented in greater depth insuring that all students are exposed to the same content (1).

Time and Learning Flexibility in Nongraded Schools:

Note: A nongraded program is one in which children are flexibly grouped according to performance level, not age, and proceed through school at their own rates. The curriculum is sometimes referred to as "continuous progress" or "developmentally appropriate."

Recently, the states of Kentucky, Oregon, and Mississippi have promoted a shift to non-graded primary schools, and many schools and districts elsewhere are moving in this direction (94, 158).

Nongraded schools, which are primarily used at the elementary level, are seen as an alternative to the negative effects of retaining students who need more time to learn.

An analysis of 57 of the highest quality studies of nongraded elementary schools found the following (94):

> a) Four general nongraded school approaches were identified: 1) approaches where students are grouped across age lines in just one subject and rely on teacher-directed instruction; 2) plans where students are grouped across age lines in many subjects and rely on teacher-directed instruction; 3) nongraded plans which emphasize

individualized instruction, learning stations, learning activity packages, programmed instruction and/or tutoring and 4) individually guided education (IGE), which also emphasizes individualized instruction by a team of teachers.

b) Nongraded programs which incorporated a great deal of individualized instruction (and correspondingly less teacher-directed instruction), including IGE were less consistently associated with achievement gain. **The effectiveness of nongraded schools appears to be due to increased direct instruction delivered at each students' precise instructional level.** Individualized instruction and other individualized or small group activities reduce direct instruction time with little corresponding increase in appropriateness of instruction to individual needs.

c) These findings are consistent with **research on individualized instruction which has consistently found student learning to be enhanced by direct instruction from teachers, as contrasted with extensive reliance on individualization, seatwork, and written materials to convey content to students.**

d) **The nongraded classroom reduces the number of within-class groups (e.g. reading, math) working at different levels in a particular classroom so that the teacher can spend the class period teaching the entire class, with little or no need for the large amounts of independent seatwork - often required in classrooms with multiple groups simply because the teacher cannot teach more than one group at any one time.**

e) **One of the main rationales for nongrading is that it allows students to spend more time, if necessary, to reach a high level of performance or to spend less time if they are able to go more quickly than other students.** Only one study, conducted in the 1960's looked at this question. In that study, in one school year, 2.9% of the students in the nongraded programs took an extra year, while 7.3% of the students who were not in the non-graded program were retained. The researchers concluded that the nongraded plan might be seen not as a way to give low-achievers more time, but rather as a way to use time and other resources more effectively. More research is needed in this area.

Many of the nongraded schools that have been created, particularly in the 1960's and 1970's, involved combining classes as a cost-cutting measure for administrative purposes rather than as a structure for supporting student learning. Since teachers

generally were not trained to teach in them, we really do not know how much potential they have for increasing student learning (161).

There is little quality research on nongraded education. Reviews of studies which have been conducted find that this approach is no more or less effective in promoting student academic achievement than the typical graded structure of schools. They do find, however, that multiage grouping does appear to be associated with better student self-concept and more positive attitudes toward school (158).

Gifted Students' Unproductive Use of Time:

Research has found that the large majority of gifted students in the country spend all but two or three hours per week in regular classrooms (11, 12).

Researchers have found that only minor modifications are being made in regular classrooms to meet the needs of the gifted. This is true for public schools, private schools, and public schools with high concentrations of African-American, Asian-American, Hispanic-American, and Native-American students. It also was found for classrooms in various parts of the country and various types of communities (13).

The regular curriculum provides little challenge for gifted students, and many textbooks are not appropriate for the gifted or for average students (14).

Many districts have eliminated resource rooms due to economic problems or concerns about the equity of grouping student homogeneously. If finances or other considerations dictate that resource rooms be eliminated, new and more concentrated efforts must be made to help classroom teachers provide gifted students with an enriched curriculum (13).

A study of third and fourth grade classrooms found that gifted students spend the majority of their time doing written assignments and participating in review/recitation activities. In addition to spending a large portion of time in passive activities, 84% of the activities across the five subject areas in which gifted students are involved contain no form of curriculum differentiation. In other words, their written assignments and recitations are identical to those done by other students. The greatest amount of curriculum differentiation occurs in mathematics, with gifted students receiving advanced content instruction in 11% of the mathematics activities (15).

The predominant use of heterogeneous grouping conflicts with what has been shown to be effective for gifted learners; that is, that homogeneous grouping produce academic gains for gifted students

(16).

The Curriculum Council of the National/State Leadership Training Institute on the Gifted and Talented established the following philosophy:

> Our philosophy of gifted/talented education is one of providing for equality of educational opportunity, with the proviso, however, that the equality of educational opportunity cannot be attained by identical educational experiences. (17: p. 5)

A national survey found significant disagreement between professionals involved with cooperative learning and professionals involved in gifted student education about whether the needs of gifted students can be met through heterogeneously grouped cooperative learning groups. Gifted and talented respondents 1) did not believe the curriculum used in cooperative learning is challenging enough for gifted students, 2) believed that gifted students resent being the "junior teacher", 3) did not believe that gifted students develop higher self-esteem by being team leaders in cooperative learning, 4) did not believe that the research on cooperative learning has focused on issues related to gifted students, 5) expressed disagreement or mixed feelings about gifted students developing social and leadership skills through cooperative learning. The professionals involved in cooperative learning disagreed with the beliefs of professionals in gifted education in each of the above areas (108).

Curricular compacting is an instructional technique that has been developed and field tested over the last 15 years for gifted and talented students. It is used by teachers to eliminate curricular activities that have already been mastered or streamlining work to allow for the completion of work at a rate commensurate with student abilities. Research indicates that the time gained through this system may then be used to provide students with alternative enrichment or acceleration activities (18).

Disadvantaged Students' Unproductive Use of Time:

More than 1 in 5 of the schoolchildren the U.S. come from families of poverty. Despite extra resources provided through Chapter 1 and educational reforms, children of poverty experience failure disproportionally in their early school years (7).

While the achievement gap has narrowed between disadvantaged students and their peers, improvements have occurred primarily in basic skills. Progress has been slow - at present rates it would take 60 years for the bottom group of students to catch up to the current level of average performance (83).

The achievement of low-performers in the U.S. lags far behind the achievement levels in other countries, and the inequality in learning within our country appears to be wider (83).

The problems of disadvantaged students are further increased by the schools that serve them. In cities, bureaucratic, isolated, and non-responsive school systems primarily serve disadvantaged, minority students. Schools with large numbers of low-income students are also those most likely to have an irrelevant, fragmented curriculum, rigid retention policies, and low teacher expectations for success (176).

Increases in the proportion of low income students in a school are associated with decreases in achievement even after individual and family characteristics have been taken into account. Non-poor students attending a school with a high proportion of low-income students are more likely to have low achievement scores than students from impoverished families attending a school with a small proportion of low-income students (176). Controlling for students' family background, 8th graders' reading and math scores are shown to decline when school poverty exceeds 30% The decline is particularly steep in schools exceeding 75% poverty (177).

There is evidence that disadvantaged students can benefit from access to curriculum emphasizing higher order thinking skills. A study of disadvantaged students in urban, suburban, and rural elementary schools found the following:

> 1) instruction that emphasizes meaning and understanding (higher-order thinking skills) is more effective at inculcating advanced skills, is at least as effective at teaching basic skills, and engages children more extensively in academic learning;
>
> 2) most of the supplemental services targeted to particular students (Chapter 1, ESL services) provide extra practice in basic skills out of context and do not emphasize meaning and understanding (8).

A Johns Hopkins analysis of data about 24,000 eighth-graders opportunities to learn (9) found:

> 1) there are important differences across schools in the numbers of students who are offered basic, advanced and exploratory courses;
>
> 2) in many schools, large numbers of students are not offered real challenges in advanced courses (such as algebra) and have few opportunities to experience rich instructional approaches that develop higher level skills;

3) when opportunities to learn more rigorous content are extended, students at all levels of ability benefit;

4) even after controlling for students' ability group membership and prior math grades, eighth graders who take an algebra course achieve significantly better than do similar students who receive high, medium, or low content math survey courses;

5) students in homogeneously grouped algebra classes, regardless of the ability level of the class, do better than students in heterogeneous algebra classes;

6) heterogeneous grouping in English classes does not disadvantage high, average or low ability students;

7) emphasis on drill and practice in the four major subject areas negatively affects test scores.

Chapter 1 and Time:

In fiscal year 1992, Congress appropriated 6.7 billion for Chapter 1, which reaches one out of every nine children in the U.S. (83).

Chapter 1 instruction accounts for only a small amount of "additional" time for learning. Some researchers have found students receive an additional 10-15 minutes a day; other researchers have found students receiving 24 to 30 minutes a day of Chapter 1 instruction (171, 83).

A major problem with Chapter 1 is the continued use of pull-out programs, which appear to add only about 45 hours of instructional time to the students' school year. A study of 11 extended-time programs found that an average of about 56 hours of instructional time was added yearly (excluding one all-day kindergarten which added 450 hours of instruction for students). Thus, the extended-time programs added nearly one-fourth more time than pull-out approaches. However, it is unclear whether Chapter 1 students actually do receive an increase in <u>total</u> instructional time. In pull-out programs, supplemental additional instruction is provided in a subject area by a Chapter 1 teacher. Students are pulled out of regular classes where instruction for other students is occurring. (171).

Not all extended-time programs had formal evaluations, but those that did reported benefits attributable to the add-on programs. These included Saturday classes, all-day kindergarten, before-school language-arts activities, hands-on after school computer time, school-and home-based computer activities, and summer school. Some researchers have recommended add-on programs before or after school and summer work as ways to increase time without sacrificing

that in the regular program (171).

Under the current system, if schools improve the performance of students, they lose Chapter 1 funds (83).

Chapter 1 remains a program where the teaching of basic skills is the norm and the teaching of higher-order thinking skills is the exception despite the fact that students who are exposed to academically challenging instruction perform better than students whose instruction focuses on basic skills.(83).

Research studies of compensatory education have repeatedly found a "fadeout" effect - the cognitive learning gains achieved in the early grades quickly dissipate and eventually disappear entirely when there is no special program to follow through in the later grades on the initial investment (90).

International Comparisons of the Use of Learning Time:

There are significant differences in the way time is distributed throughout the year in Asian and American schools (1). In contrast to the two day weekends and long summer vacations that provide discontinuities in American schools, time flows more continuously in Chinese and Japanese schools.

Children in the U.S. spend nearly 50% of their time in seatwork (filling in workbooks, handout sheets etc), but never more than 30% in Asian classrooms (1).

American children spend more time out of their seats, talk more to their peers at inappropriate times, and engage in other inappropriate activities to a greater degree than Japanese or Chinese children. For example, fifth-graders are out of their seats nearly 20% of the time while Asian children are out of their seats less than 5% of the time (1).

During the early months of elementary school, children learn skills that will help them to use time efficiently and function effectively in groups. They learn how to move from one activity to another, how to arrange the contents of their desks, how to pay attention, follow directions, and speak loudly and clearly so they can be understood (1 & 6).

Teaching routine procedures enhances equal opportunity to learn for students from diverse socioeconomic backgrounds. Students from lower socioeconomic classes who may not have been taught well by parents to behave in certain ways learn productive ways to behave (6).

Asian classrooms are calm and orderly. Responsibility for discipline is assumed primarily by students (1, 6).

Asian teachers do not spend large amounts of time lecturing. They present problems, pose provocative questions, probe and guide students. The students work hard, generating multiple approaches to a solution, explaining the rationale behind their methods, and making good use of wrong answers (1).

Japanese teachers provide students with time to think. Each concept and skill is taught with great thoroughness, thereby eliminating the need to teach the concept again. Questions posed by Japanese teachers stimulate thought. These practices differ significantly from those used by American teachers who cover and re-cover large amounts of material and ask questions to get an answer (1).

Research indicates that Japanese education focuses on higher order thinking skills, not the teaching of facts (1, 6).

Moral education classes in Japan and China attempt to inculcate values and practices that demonstrate respect, fairness, rationality, and other attributes of a good citizen and family member (1).

In Japan, classes of students stay together in the same room. The teachers come to them (6).

Asian teachers have classes of 38 to 50 children and do not track or separate students according to ability (1).

Japanese and Chinese parents expect their children to learn social skills in nursery school and kindergarten (1).

RESEARCH FINDINGS THAT SUPPORT BOTH MORE AND BETTER USE OF TIME

Analyses/Syntheses of Educational Research on Productivity:

Syntheses of 2,575 studies of learning suggest that nine factors are powerful and consistent in influencing learning (19):

1) Amount of time students engage in learning;

2) Quality of the instructional experience including method and content;

3) Ability, or prior achievement;

4) Development as indexed by chronological age or stage of maturation;

5) Motivation or self-concept as indicated by personality tests or the student's willingness to persevere intensively on learning

tasks;

6) **"Curriculum of the home";**

7) **Morale of the classroom social group;**

8) **Peer group outside school;** and

9) **Minimum leisure-time television viewing.**

Views of Learning from Cognitive Research:

Recent cognitive research suggests that the entire educational program must be restructured so that thinking pervades students lives from kindergarten onward in all subject areas (2). Rather than learning facts, students need to learn how to relate new information to what they already know, to interpret, question, analyze, construct arguments, problem solve etc. Schools need to teach content knowledge and thinking skills at the same time.

The processes involved in learning higher order thinking skills take a great deal of time, much more time than is typically allowed for the study of any topic in the school curriculum (2, 3). Real, usable knowledge cannot be constructed from brief exposures to information. Effective learning takes extended practice, not short, discrete lessons. Single problems may take up whole class periods or longer; essays are revised and reworked many times; several hours may be spent interpreting just one story.

Because learning for understanding takes more time, difficult choices will have to be made about what content to include. Textbooks will have to abandon their common practice of "covering" a great deal of information by treating it briefly with few connections among information (2, 3).

In addition, cognitive researchers argue that **students will need to learn certain key concepts in each discipline in order to organize and structure the large amounts of information available.** Each discipline has key concepts that serve as organizers and help students retain and understand new information.

There is much that is not known about how to arrange learning experiences that will help students do their own knowledge building. For example, while we know that effective learning is not teaching facts, we also know that highly unstructured "discovery" or "exposure" programs do not work for all students. (3) **This suggests that teachers may need more time to experiment and develop effective teaching strategies.**

Technology:

Shoshana Zuboff, Information Technology Specialist at the Harvard Business School and author of In the Age of the Smart Machine, points to the importance of both teaching learners how to use technology throughout their lives and developing ways to exploit technology to enhance higher order thinking in schools:

> 1) Today, there is one computer in this country for every two or three members of the labor force. Sixty-five percent of all our professional, managerial, technical, and administrative workers spend a significant portion of their day interacting with a computer terminal. And this is becoming increasingly true for our factory workers as well. The diffusion of this technology is immense, but our ability to organize and educate ourselves to leverage its unique capacities is still very, very much lagging behind the presence of the technology itself.
>
> 2) Every other technology in human history has had the effect of simplifying work, of taking the complexity out of a task. Information technology is the first in human history to reverse this process by raising the intellectual character of the task.
>
> 3) Beyond the basic skills which are essential, we need a new emphasis for student learning, not just on content, but on process, because we need to be teaching not only subjects, but how to learn. Knowing how to tackle content, how to learn from it, is going to be the key. This involves things like how you relate to a text; how you decipher and analyze it; how you recognize patterns, interpret meaning; how to think conceptually and abstractly.

Despite the promise that technologies offer to schools, and despite encouraging developments in some places, its potential is not widely realized. Programming and computer literacy in secondary schools, and drill in basic skills, have dominated computer use in most schools (184).

While quality research on the use of technology to support the development of higher order thinking skills is practically nonexistent, there are examples of teachers who are successfully experimenting in this area. Some teachers and their students have demonstrated how technology can be used to conduct original research, analyze current issues, collaborate with students in other schools on complex projects, and run experiments. These innovative teachers, who report that such uses of technology stimulates student motivation, point to changes in the use of time in classrooms. They have found that technology alters the pace of

instruction. In some cases, progress through the curriculum may be slowed as students use computers and other technologies to explore a topic in more depth, to review information, or solve problems associated with information. In other cases, the use of technology may speed up learning. **The teachers point to the problems associated with traditional time blocks during the day and suggest that time for learning be flexibly restructured** (187).

Even under the best of circumstances, **it takes a great deal of time for teachers to become comfortable with new technologies and fully incorporate them into their classroom curriculum.** To the standard problems of initiating change in schools, technological innovation has the additional problems associated with technical complexity and expertise, an area which has heretofore been absent or treated only superficially in teacher pre-service and inservice education (179).

Estimates of the amount of time it takes teachers to be effective users of technology vary from one to six years (179, 180) depending on what teachers are expected to be able to do. For example, a teacher could reasonably learn how to use equipment and software for drill and practice during the first year. However, it may take five or six years for teachers to use technology in ways that support higher order thinking skills, decision-making, collaboration etc.. One study (180) found the following:

> 1) **The percentage of teachers who use drill and practice software decreases with experience** from more than 40% for those with less than two years' experience to less than 30% for those with more than nine years' experience;
>
> 2) **The percentage of teachers who use data-bases increases with experience** from about 10% for teachers with less than two years' experience to about 20% for those with five years' experience;
>
> 3) **The percentage of teachers who use word processors increases** from about 60% for those with less than two years' experience to about 80% for those with five to six years' experience;
>
> 4) **Teachers with less than two years' experience use an average of 10.8 different applications of technology while those with nine years or more average 17.1.**

Lack of time is a major barrier for teachers use of technology. There is not enough time for teachers to prepare computer-based lessons, nor enough time in the school schedule for computer-based instruction. There also are problems scheduling enough computer time for different classes (180).

Teachers do not have adequate experience with instructional

technologies nor access to appropriate professional development to acquire the necessary skills (178).

No standards or guidelines exist to assist schools in using educational technologies. Consequently, substantial resources are wasted on applications that are inflexible or of poor quality (178).

A study (185) of 550 elementary, middle, and high school educators accomplished in using telecommunications (computers, modems, and telephone lines) for 3-4 years found:

> 1) Lack of time in the school schedule and inadequate financial resources are the most persistent barriers to effective telecommunications use;
>
> 2) The majority of the teachers were self-taught. Support for telecommunications at the school and district level is virtually nonexistent;
>
> 3) Communicating with other educators, accessing information, and combating professional isolation are the most highly rated incentives for using telecommunications as a professional resource;
>
> 4) News services and scientific databases are rated as the most useful information retrieval activities for use with students;
>
> 5) The most highly rated incentives for using telecommunications with students include expanding students' awareness about the world, accessing information that would otherwise be difficult to obtain, and increasing students' inquiry and analytical skills;

Approximately 500 teachers who reported that computers changed their classrooms indicated that technology 1) allowed them to expect more from their students (72%), 2) permitted them to spend more time with individual students (70%), 3) less time lecturing to the class (52%), and 4) less time with the whole class reviewing material (180).

Research and evaluation of computer-assisted instruction (CAI), which delivers drill and practice exercises on basic skills shows significant positive effects on student achievement at the elementary, secondary, and post secondary levels (181).

Evaluation of technology use in many innovative and complex reform projects often has shown no measurable effects (179).

It is not the technology itself that is likely to improve student performance, but the way in which the technology is used.

Technology in an of itself can accomplish very little in educational reform; critical is how the technology is used, the functions it serves, and the extent to which it is grounded in and advances sound instructional practice (179). As Isaac Asimov once said, the important thing to forecast is not the automobile, but the parking problem; not the television, but the soap opera (184).

Technology makes possible more complex and more effective approaches to teaching (184).

It has not proved particularly effective to simply make the technologies available and watch what happens (182).

The use of technology in schools is growing. For example,

1) More than 5,000 schools currently have satellite dishes; more than 80% have direct cable access;

2) Students are using computer-based programs to explore topics at their own pace and to contribute to collaborative projects. Scientific data are being shared through experiments available on electronic networks such as the Internet. More than half of the schools in the country have modems or are connected to a network;

3) In 28 states, teachers are using statewide electronic networks to share ideas and lesson plans, discuss issues of common interest, and obtain information for planning, curriculum development, and instruction (178).

Skills and Qualities Needed in the Workplace:

The Secretary of Labor's Commission on Achieving Necessary Skills (SCANS) identified the **skills and competencies students need to develop to function successfully in high performance workplaces, many of which are not taught in schools today.** They include three "Foundation Skills" and five "Workplace Competencies" (20).

Foundation Skills:

1) **Basic Skills** - reading, writing, arithmetic and mathematics, speaking and listening;

2) **Thinking Skills** - the ability to learn, to reason, to think creatively, to make decisions and to solve problems;

3) **Personal Qualities** - individual responsibility, self-esteem and self-management, sociability, and integrity.

Workplace Competencies:

1) **Resources** - workers know how to allocate time, money, materials, space, and staff;

2) **Interpersonal Skills** - workers can work on teams, teach others, serve customers, lead, negotiate, and work well with people from culturally diverse backgrounds;

3) **Information** - workers can acquire and evaluate data, organize and maintain files, interpret and communicate, and use computers to process information;

4) **Systems** - workers understand social, organizational, and technological systems; they can monitor and correct performance; and they can design or improve systems;

5) **Technology** - workers can select equipment and tools, apply technology to specific tasks, and maintain and troubleshoot equipment.

Overall Trends in Academic Performance: (21)

During the past two decades, there has been little change in the levels of educational achievement in science, mathematics, reading and writing.

While students are learning facts and skills, few show the capacity for complex reasoning and problem solving.

White students consistently have higher average achievement than their Black and Hispanic counterparts at all ages and in all curriculum areas. While there has been some improvement in the performance of minority group children, the gap between them and white children remains large.

Few changes were apparent in the past two decades in students' attitudes toward learning. In 1990, reading and writing were infrequent activities and students reported less access to a variety of reading materials in their homes. Also, **the amount of televisior increased, while the amount of homework stayed about the same.**

The National Assessment of Educational Progress asked 17-year-olds about the extent of their course taking in 1982, 1986 and 1990. Key findings include the following:

1) **In 1990, only general science and biology were studied for at least one year by more than half of the 17-year-olds, and only one in ten students reported having studied physics for a year or more. However, greater percentages of students were enrolled in high-school science courses in 1990 than 1982.**

2) In 1990, more students took upper-level mathematics courses such as Algebra II than had in 1978. However, **only about half of the 17-year-olds has pursued mathematics study through Algebra II.**

Research Related to the Disciplines:

Academic performance of American elementary school children in mathematics is clearly poorer than the performance of Japanese and Chinese students. In Stevenson's study of Chinese, Japanese and American elementary school classrooms, the highest-scoring American classroom obtained an average score lower than that of the lowest-scoring Japanese classroom and of all but one of the 20 classrooms in China. **In comparing the performance of American and Chinese students, there was no area in which the American children were competitive with those from China.** The Chinese children's superiority appeared in complex task involving the application of knowledge as well as in the routines of computation (1).

The course that makes the greatest difference in college success for minority high school students is geometry. Eighty-three percent of minority students who take high school geometry attended college. **Minority students actually enroll in geometry at less than half the rate of enrollment by white students** (27).

There is little basic research on geography; a lack of agreement about what to teach in geography and how to teach it; and little geography taught in American classrooms. Most social studies teachers take no course work in geography in their undergraduate studies (97).

Key research findings related to mathematics include the following:

1) **The average grade 4-6 class spends 4.8 hours per week on mathematics.** There was no change in the amount of time students spend on mathematics between 1988 and 1991 (146).

2) **Class time on grade 4-6 mathematics varied by state from an average of 3.8 hours per week (45 minutes per day) to over 5.5 hours per week** (146).

3) From 1990 to 1992, enrollments in higher level mathematics courses (above algebra I) increased in three-fourths of the states. **Course enrollments vary by state at all levels; for example, enrollments in algebra 2 by graduation vary by state from 31% to 73%** (146).

4) Between 1990 and 1992, the percent of students taking algebra II increased an average of 6% during the period. **Nationally, 55% of students take algebra II** (146).

5) In 1990 National Assessment of Educational Progress (NAEP), teachers reported their views on the availability of materials and resources they need to teach grade 8 mathematics. **The percent of mathematics teachers reporting they had "some or none" of needed materials varied by state from over 45% of teachers to less than 20% of teachers. A high percentage of teachers in a state reporting a problem with materials and resources was associated with lower average state math proficiency on NAEP** (146).

6) **Algebra II enrollments increased 18% among Hispanic students and 15% among African-Americans from 1982 to 1990.** In 1990, 39% of these minority students were taking algebra II by graduation. Algebra II enrollments among whites went up 13% (146).

7) **The 1992 National Assessment of Educational Progress in mathematics showed that 18 states had significant improvement in student proficiency at grade 8 since 1990.** Average mathematics proficiency declined in no states. Nationally, 61% of grade 8 students scored at or above the Basic achievement level, 23% were at or above the Proficient level, and 3% were at or above the Advanced level.

8) **Previous attempts to provide universal access to mathematics have resulted in the creation of two forms of mathematics education; one for social and economic elites emphasizing reasoning and rigorous content, and another for the rest of society, emphasizing basic computation** (98).

9) **More than half of American students assert the belief that learning mathematics is mostly memorization** (98),

10) A 1992 survey of mathematics teachers found that **only about half of the teachers at all grade levels saw their colleagues as a source of information on new teaching ideas and even fewer saw professional meetings as a source of ideas** (98),

11) **Teachers in the elementary and middle grades possess limited knowledge of mathematics; and secondary teachers, although generally more knowledgeable about the subject, often possess a limited array of teaching strategies** (98).

12) **Short-term inservice is ineffective for changing mathematics teaching** (99),

13) **Despite widespread acceptance in the academic**

community of the reform vision, many teachers do not share that vision or do not consider it feasible for them (99)

14) Although mathematics content is important and needs continued study, the consensus seems to be that improvement in mathematics will ultimately rest much more heavily on better instruction than on better content (99).

Key research findings related to science include the following:

1) The average grade 4-6 class spends 3.1 hours on science. From 1988 to 1991, the average class time on grade 4-6 science increased by 10 minutes per week (146).

2) Science class time varied by state from an average of 2.3 hours per week (28 minutes per day) to 4.3 hours per week (146).

3) Enrollments in higher level science courses (above first-year biology) increased in 80% of states from 1990 to 1992. Nationally, 49% of students take chemistry by graduation, which indicates the proportion of students completing 3 high school science courses (146).

4) From 1982 to 1990, chemistry enrollments increased 24% among Hispanic students and 19% among African- Americans. In 1990, 40% of students in these groups were taking Chemistry by graduation. Chemistry enrollments increased 18% among whites to 52% (146).

5) Course enrollments in science vary by state. For example, enrollments in chemistry by graduation varied by state from 33% to 67% (146).

The Need for Parent Involvement:

In a national survey, teacher educators saw specific needs to provide parent education in the areas of discipline and behavior management, home tutoring, homework support, child development and mental health (170).

There is much concern about a broad trend toward the decreasing commitment of parents to their children. Two thirds of parents now report that they are less willing to make sacrifices for their children than their own parents would have been (41).

Some researchers have pointed to the importance of child-rearing practices that inner-city, minority families use to motivate their children. Students' family environment has been cited among the

causes for the disproportionate placement of minority students in special education programs. Competent children have better parental relationships; their parents are more supportive of their goals; and they provide a clearly defined system of sanctions (168).

Research on short-term intervention programs aimed at helping parents become more effective at parenting show moderate and sometimes large effects on student learning (168).

The Importance of Family Atmosphere and Parental Expectations:

The values parents and adolescents have about education have twice the impact on black and white students achievement as their socii-economic background (166, 167). Valuing education and having high expectations for achievement are powerful influences. When parents, students and their peers believe in student responsibility, students make a greater effort and have a better chance of succeeding in school (166)..

Several studies show that family atmosphere rather than family composition is most predictive of dropping out of school. Particularly significant are parents' educational expectations for students (162).

A recent study of seventh and ninth grade students (approximately 50% minority) found that academic achievement is positively related to parental educational encouragement, but not to the amount of time spent with parents. The researcher suggests that many parents are not doing a great deal to promote academic achievement on the part of their children. Similarly, time spent on television had positive effects on achievement among respondents with parents in lower-status occupations, but negative effects among respondents with parents in higher-status occupations (39).

A stable, supportive adult network is important to parenting and child development. However, two-parent households are not always stable and supportive, and single-parent households are not always isolated and overwhelmed. The support of friends and extended family may help bolster the resilience and resources of both single-parent and two-parent families (88).

A study of young people from low-income black homes with varying family structures, found that the parents of high academic achievers set firm but not harsh rules, seek information about their children's academic progress, enhance literacy skills through activities such as reading and word games, and model an optimistic, assertive approach to life. The two-parent and single-parent families in the study that had these characteristics produced higher achieving students while the two-parent and single-parent families that lacked these characteristics produced less successful

students (89).

Working Mothers/Single Parent Families and Learning:

Although some people believe that there is a straightforward relationship between mothers who work and poor student achievement, the research does not support this conclusion:

a) Leading researchers have found that the effects of mothers' employment on achievement are generally positive for elementary school children in disadvantaged, single-parent families (162).

b) The effects of mothers' employment on white, elementary school students from two-parent homes are negative (162).

c) Mothers' employment apparently has the most negative effects on achievement for the most advantaged students, children who do not drop out of school, and children whose mothers are potentially the most competent teachers (163).

d) When the mother works appears to make a difference with the greatest negative effects stemming from mothers' employment during the preschool years. Some researchers have found that the negative effects of mothers' full time employment during her child's preschool years are generally higher than the effects of her employment during her child's elementary school years, which in turn are more negative than her employment during the child's high school years (162). Other researchers have found that only during the preschool period does mothers' employment have eventual, significant, negative effects on the achievement of high school sophomores and seniors (165).

e) The achievement of children whose mothers worked part-time or increased their labor force participation during the life of the child tends to be higher than or similar to the achievement of children whose mothers never worked (163).

f) An extensive study of sixth grade minority children in California found that working mothers actually spent more time facilitating their children's activities that those who did not work (171).

g) Still other studies have found that maternal employment has not been found to effect the educational progress of children (148), the number of years of

schooling the children complete (149), or the child's verbal development (150). Earlier studies suggest that working mothers spend less time at home, but that they spend as much time interacting with children as do nonworking mothers (151, 152).

In a major study of successful schools, researchers found that mothers of children in successful schools are slightly more, not less, likely to work (85).

Asian parents are more involved in their elementary school children's schooling than American parents. This is often attributed to the tendency of American mother to work outside the home and to the breakdown of the nuclear family. However, maternal employment may not offer a satisfactory explanation for the lower degree of American's involvement in their children's academic work, nor does the incidence of single-parent families. In the families studied by Stevenson (1) the percentage of mothers employed full time in the U.S., Japan and China did not differ appreciably (35%, 30% and 33% respectively).

Although some people believe that children from "broken homes" have a higher incidence of academic and emotional/behavioral problems than other children, this belief may be more a stereotype than reality. While research findings appear to be mixed on the surface (88), the key issue is whether family income and other variables are taken into account in the research.

a) In general, students from two-parent families do have higher scores on reading and math achievement tests than students from one-parent families. However, the negative effects on achievement of living in a single-parent family are almost entirely mediated by other variables, particularly income (162).

b) Other studies show no relationship or, surprisingly a negative relationship between single-parent families and academic or emotional problems. For example, another analysis of High School and Beyond data indicates that the effect of father absence on dropping out is nil for all gender/ethnic groups except for non-Hispanic white females, who are significantly more likely to drop out if the father is present in the home (162).

c) There is also evidence that stereotypes about children from broken homes may adversely affect children. Well adjusted children from healthy single-parent homes may "live down" to the low academic expectations of school staff.

d) Researchers (88) analyzing the range of studies on the effects of single-parent families conclude that there is

little strong evidence that single-parent families intrinsically place children at risk of serious, long-term problems. Few researchers control adequately for the influence of parental education, age, or socioeconomic status in their studies.

The Effects of Family Involvement on Different Students at Different Points in the Student's Life:

There is not a clear, direct, and simple link between parent time with children and academic achievement. For example, parent involvement has been found to have little direct effect on achievement except for middle socioeconomic class (SES) children. High SES children have high achievement independent of parent time; and low SES children show little improvement even with more parent time (103).

A large study (28,000 students) using High School and Beyond data found that parental involvement had no effect on high school senior's achievement scores, but did positively influence the amount of time seniors spent on homework. The degree of parental involvement was measured using the questions: a) "My parents almost always know where I am and what I am doing," and "My mother keeps close track of how I am doing in school." Other research, which has found a relationship between parental involvement and student achievement, was conducted on elementary school children (153).

Parental concern is associated with lower math and reading scores. This suggests that low math and reading scores serve as a warning flag to parents resulting in greater monitoring and attention to the student's school progress and use of time (166).

Mothers of higher socioeconomic status invest an estimated average of 4,100 household hours directly caring for each child prior to elementary school; lower status mothers invested only 1,120 hours (169).

Youth and Violence:

Violence involving youth has increased dramatically in the past 15 years. 1993 Commission findings (183) include the following:

1) Students carry an estimated 270,000 guns to school every day. Between 1979 and 1989, there was a 61% increase in homicides by shootings committed by youth aged 15-19.

2) The intensity of violence involving children has escalated dramatically. At the Children's National Medical Center in Washington, DC, the rate of penetrating

trauma (bullet or stabbing wounds) has increased by 1,740% since 1986.

3) Teenagers are two-and-one-half times more likely to be victims of violent crimes than those over the age of 20. Much of this violence occurs around schools.

4) Homicide is the most common cause of death for African American youth. An African American male is 11 times more likely to die by homicide than a non-African male.

5) The American Psychological Association Commission on Violence and Youth reports that there are 5-6 violent acts per hour on television during prime time; there are 20-25 per hour on Saturday morning children's programs. Ninety-eight percent of American homes have at least one television which is watched each week an average of 28 hours by 2-11 year olds and 23 hours for teenagers. Low income children are the heaviest viewers. Higher levels of viewing violence on Television contributes to increased acceptance of aggressive attitudes and behavior.

6) The U.S. has the highest rate of interpersonal violence of any industrialized country.

7) Violent behavior is a learned behavior.

8) Aggressive and disruptive classroom behavior contributes to poor school achievement and peer relations which makes later antisocial behavior more likely. School-based interventions can improve students' social behavior and reduce at-risk behavior among youth not seriously violence-prone by teaching them how to cope with crises and offer problem-solving skills and anger management.

RESEARCH-BASED OBSERVATIONS

High achieving countries share one characteristic: a culture of learning. Unless the task of learning is valued, the teaching strategy may be irrelevant (81).

The case for a curricular structure in mathematics that parallels the curriculum of Japan has been put before U.S schools for almost a century. It has been rejected for what may be viewed as good or bad reasons depending on one's perspective. From that point of view, the aggregate achievement of U.S. schools that emerges must be regarded as intentional from the point of view of the system

(96).

The purpose of Asian education is to teach academic skills and knowledge. Because of the belief that not every child has the ability to master the academic curriculum, and because of a commitment to provide schooling for all children, Americans find it hard to decide what it is they expect from the nation's schools. One reason they are unwilling to define the goal of education narrowly as academic excellence is that they believe only some children are capable of achieving it. Instead, Americans place a higher priority on life adjustment and self esteem. They assume that positive self-esteem is a precursor of competence rather than realizing that one of the most important sources of a child's self esteem is mastering a challenging task (1).

A frequent argument is that we cannot use practices developed in Japan because their student population is heterogeneous and ours is so diverse. It is not the diversity in children's social and cultural background that causes difficulties, but rather, diversity in children's preparation for learning academic curriculum. Japanese and all teachers face diversity in academic readiness (1).

Expectations held by mothers are much higher for Asian than American children. They are much less satisfied with their children's performance in school and with the performance of elementary schools (1).

It is not uncommon in Western European countries for elementary schools, instead of having a rigid system of grades, to combine grades 2 and 3 or grades 4 and 5 (81).

There is a great deal of variation and a high degree of innovation among and within OECD countries in the techniques used for teaching academic subjects (81).

A paradox exists with regard to textbooks. Decentralized systems such as the U.S. often have more prescribed textbooks than do centralized European countries (81).

In European countries, teachers do not depend on "pre-digested texts to the extent that American teachers do. Teachers are likely to work from a number of books and supplement these texts with a variety of other materials. Europeans also make more use of primary materials at both the elementary and secondary levels (81).

The job schools now face is to bring all students to a level that, in the past, only a small minority reached (20).

Where ability is concerned, equality consists of providing equally well for all kinds and levels of individual differences (29).
Conventional approaches to curriculum for disadvantaged students - and slow learners of any kind - do not provide a basis for academic

success. The approaches tend to 1) break up reading, writing,and mathematics into fixed sequences of discrete skills, ordered from the simplest (the basics) to the more complex (higher-order skills) and 2) require mastery of the basics before moving to more complex curriculum. By this line of argument, children who have not mastered spelling are not thought ready to read stories. This approach 1) underestimates what students are capable of, 2) postpones more challenging and interesting work for too long, and in some cases forever, 3) fails to provide a context for learning, and 4) reinforces academic failure over the long run (7).

The emphasis on a basic skills curriculum for disadvantaged students may place an unintended ceiling on learning by repetitively exposing students to an impoverished "basics only" curriculum and nothing more (7).

Lack of a national curriculum has negative consequences. Enormous diversity in what is taught in the nation's schools and the fact that not all children have access to a basic core of knowledge and skills means that large numbers of Americans cannot compete for future employment or participate fully as citizens (1).

Circumstances shape an adult's sense of what is possible, thereby influencing his or her attitude toward time as well as toward children's use of time. **Whether opportunities seem limitless or limited affects people's view of time use.** For example, for the male child born into a professional middle class family, the sky is the limit, and he begins early to make plans for his future. For the disadvantaged male, the experience is just the reverse. **Messages coming from parent to child about time use are, in part, a function of whether parents believe they can manipulate their child's environment advantageously. It is reasonable to plan and prepare for the future if success seems likely. The likelihood of success becomes a factor influencing how time is valued. For many disadvantaged people, the time-bound, regularized world of the middle class makes no sense** (95).

The idea of harnessing out-of-school time for educational support means creating a time-use environment and not just having parents adhere to a checklist of activities that children should do. Increasingly parent time is at a premium. In many families, even the most basic tasks of household upkeep are performed under pressure. **In the future parents may have a greater impact on their children's attitudes toward out-of-school time than on actual time use decisions. In an era of diminishing parent time, the values about time use that adults convey to children will matter a great deal** (95).

In 1989 approximately 19% of all children lived in poverty. By age group, the highest proportion of children living in poverty are under six years of age. The number of children living in poverty is expected to increase. Our schools will need to serve over 4

million more children in poverty by 2020 than they did in 1987 (87).

The homes of the best schools are more likely to have parents who directly encourage their children to learn. They monitor schoolwork more attentively and maintain higher expectations for achievement (85).

INCENTIVES/MOTIVATION

THE CHARGE:

To conduct and analysis and make recommendations concerning the use of incentives for students to increase their educational achievement in available instructional time.

Psychological Studies:

A number of cognitive researchers argue that an educational program which encourages students to challenge and think is more intrinsically motivating than a program which requires them to memorize discrete facts. When learning is interesting, when students are challenged to understand relationships and think through problems using new information, they are more motivated to learn (2).

Some educators fear that American children cannot sustain the long hours necessary to achieve well by international standards. They believe that either heredity or American culture prevents students from learning, and that to press them further might cause psychological stress, suicide, and unhappiness (171).

Research shows that effort does not cause unhappiness. Psychological research shows that life's greatest pleasures include the development of skills and absorption in constructive activities. Research on adults shows that such experiences are more often encountered in work than in leisure; and high school students encounter them most frequently when opportunities sufficiently challenge their skills both in school and outside pursuits (19, 171).

For students age 10 to 19, Japanese suicide rates in 1984 were about half the U.S. rates which had more than doubled since 1965 - a period according to U.S. education reform reports, of slackened educational standards and declining student effort (171).

Educational researchers have noted an increase in teacher-student bargains, in which teachers lower their standards in exchange for classroom cooperation (31).

Many teachers are in conflict about setting higher expectations for low-achieving students. They seek to reconcile the added student effort that higher expectations require with their concern that disadvantaged and low-ability students may be excessively burdened (31).

Sympathy offered to students when they fail, praise offered for modest accomplishments, and help given when it is not requested, are perceived by students as signs that they lack ability (30).

Students in this country prefer to be called smart rather than hard-working. They believe that hard-working students risk being considered either excessively ambitious or of limited ability (31).

Rewards and Incentives:

While Americans believe in the ideal that all students should learn as much as their ability and effort will permit, schools reward only high achievement. The effort of less talented students is not acknowledged and the grades they receive are not inspiring. Low-ability and disadvantaged students, those who must work the hardest, have the least incentive to do so (31).

There is a large body of research concerning the effects of competitively-based extrinsic rewards on school performance. Students offered extrinsic rewards chose easier tasks, are less efficient in using the information available to solve novel problems, and tend to be answer-oriented and more illogical in their problem-solving strategies. They seem to work harder and produce more activity, but the activity is of lower quality, contains more errors, and is less creative than the work of comparable non-rewarded subjects working on the same problems (32).

Competitive incentives do encourage learning for the relatively few students who believe they can win the prize (32).

In a study of over 700 8th graders and 700 12th graders, researchers offered to pay students one dollar for every correct answer on approximately 40 National Assessment of Educational Progress test items. Researchers found that students who had been provided a financial incentive performed only slightly better (responding correctly to 28.5 of the 41 items) than students in a control group (responding correctly to 25 of the 41 items) who were not offered the incentive (116).

International Comparisons:

American students score worse and study less than students in most other developed countries. They also spend 70% less time studying than students in four of the five top-ranked countries (30).

When compared to Japan, there are a number of the values inherent in American culture that distract from rather than support student motivation to learn (6):

> a) In the United States, pre-college students focus on many different interests, and school is only one of them. In Japan, the priority is on academic education. Schooling is the primary cultural goal for young people.

b) **The U.S. values the world of work and money.** We believe adolescents should have part time jobs - that it is good for them. We also believe they should have and learn how to spend money. Japanese schools, in contrast, prohibit students in the "college track" from working. Students in vocational schools are only allowed to work in jobs supervised by a teacher.

c) **Romance and peer group activities are promoted** by U.S. culture and schools. In the U.S., we believe that students should spend time with peers and learn to be independent. We believe they should be popular and date. In Japan, it would be unthinkable for a school to sponsor a dance. Social activities such as dating, driving, and spending money are postponed until students have completed the equivalent of high school.

d) In the U.S., **we expect students to learn to develop responsibility outside of school**, often through work. In Japan, school is seen as the place to develop responsibility.

e) In the U.S., **we worry about what is relevant for students to learn.** Whether something is relevant or not in Japan is not the issue for college-bound students. The issue is that you have to pass entrance exams. One third of Japanese students attend 2 or 4 year colleges. For the two-thirds of the students who do not attend college, there are motivation problems.

In a study of ten countries (Canada, Britain, Israel, France, New Zealand, South Korea, Germany, Taiwan and Japan), researchers conclude that **the U.S. tests more frequently, but puts less emphasis on test results. Essay testing is the international norm** (82).

In a study of ten countries (Canada, Britain, Israel, France, New Zealand, South Korea, Germany, Taiwan and Japan), researchers conclude that the major single difference among educational systems appears to be culturally based. **Children who come from homes where learning is expected and supported do well in any of the school systems. Among nations with the most rapid economic growth, education is more likely to be viewed as hard work than it is in the U.S. It is not any individual issue like money, class size, teacher preparation or governance that will establish world class schools in the U.S. Parents and teachers will need to unite to instill an education ethic in each student** (82).

Asians place an emphasis on effort while Americans emphasize ability. Under the ability model, motivation depends on the individual child's assessment of whether he had the ability to succeed. A student either has it or does not. The effort model,

in contrast, errors are seen as a natural part of the learning process and students take an optimistic view, believing that hard work will result in success (1).

Asian cultures use three strategies to socialize students and motivate them (1):

1) **Modeling:** Asian countries use this strategy extensively. **They find people who exemplify the ideals held by the society and select aspects of their lives that can be described simply and dramatically. The descriptions are consistent and repeated frequently,** so that the characteristics are well known. Earlier in this century, such models existed and every American student was aware of the inventiveness of Ben Franklin, the compassion of Florence Nightingale, the hard work or honesty of Abe Lincoln. **For the most part such cultural models in the U.S. have been replaced by sports figures and entertainers.** New models emerge because of their hairstyles, dance techniques, material possessions, dress etc. No conscious national effort has been made to develop such models in the U.S.

2) **Group Control:** Group identification provides a strong, effective means of heightening children's motivation toward particular goals and is used extensively in Asian countries. **In contrast, the U.S. places emphasis on the individual and the development of a self-directed and motivated child.** In Asian classrooms teachers ask students to generate their own solutions and call on other students to evaluate the accuracy or relevance of the answers. The Asian student who has not studied faces the disapproval of his or her peers. **In the U.S., teachers lecture and are more likely to assume responsibility for the students' learning.**

3) **Explicit Teaching of Routines:** Rather than expecting children to be able to demonstrate a particular form of behavior spontaneously or in response to commands, **Asian teachers explicitly teach the component skills that are necessary for smooth operation of the classroom** (1).

RESEARCH-BASED OBSERVATIONS

When considering student motivation, **the Commission cannot overlook the importance of exit examinations in most of the OECD countries. These examinations, which come at the end of secondary school, provide the chief motivating force for many students** (81).

In some countries, such as France and Japan, **student motivation to do homework is fueled not only by the traditional importance**

assigned to homework, but also by the wish to be admitted to a particular track or a particular secondary school (81).

When student achievement drops, parents and policy-makers seldom blame the study habits of students. They blame the schools and the teachers. Consequently, over the past 25 years, most educational reforms have assumed that achievement would rise if the quality of instruction, teachers, and textbooks were improved (31).

The past decade has produced strategies to force greater student effort through minimum competency, reinstating a core curriculum, and raising graduation requirements. Little effect has been had for the majority of students, particularly at the secondary level (31).

In its quest for the well-rounded student, American society steers the attention of students away from academics. **Parents, teachers and many colleges have not given students the clear message that academic achievement is valued** (31).

Many low achieving students deny the importance of learning and withhold the effort it requires in order to avoid the stigma of having tried and failed (31).

Many school policies discourage student effort. For example, to increase graduation rates, some schools have allowed students to design their own courses of study, offered credit for less rigorous alternatives to core subjects, and awarded diplomas to students who merely stayed in the course (31).

STUDENTS' TIME OUTSIDE OF SCHOOL

THE CHARGE:

To conduct an analysis and make recommendations concerning how children spend their time outside of school with particular attention to how much of that time can be considered "learning time" and how out-of-school activities affect intellectual development.

The Need For and Availability of Out-of-School Programs:

There are vast inequities in the availability of out-of-school programs for youth. The 1988 National Education Longitudinal Study (NELS) found that 71% of eighth graders were involved in some type of organized activity outside of school. Although the NELS study did not uncover significant differences according to race and ethnicity, it did identify **a wide disparity in participation between upper and lower income groups.** Only 17% of eighth graders from families in the highest socioeconomic quartile did not participate in organized out of school activities, while 40% of low-income youth reported no involvement. Other studies support this conclusion (33).

For 15 years, funding for recreation services has steadily declined. Publicly supported recreation programs are evolving into a two-tier system, with more and better services available in suburban areas than in less affluent rural and urban areas. The current fiscal cutbacks are serving to increase the disparity between upper and lower income areas, meaning that **youth most dependent on public recreation services are increasingly less likely to have them** (33).

A study of high school students found that **students involved in organized activities had higher self-esteem, higher grades, higher educational aspirations, lower delinquency rates, and a greater sense of control over their lives** (34).

When asked to rank seven possible causes of students having difficulty in school, 51% of teachers interviewed in a 1987 Louis Harris opinion poll singled out "children who are left on their own after school" as the number one factor (35).

The National Association of Elementary School Principals reported in 1988 that **84% of responding principals said that children in their communities need increased access to organized before- and after-school programs and 37% of principals believe children would perform better in school if they were not left unsupervised so long outside of school** (33).

Five surveys of employers of high school graduates conducted between 1983 and 1991 strongly point to the importance of the kinds of skills and attitudes often (though not exclusively) promoted through nonformal learning situations. For example, a Committee for Economic Development (1991) survey conducted by Louis Harris found that lack of dedication to work and discipline in work habits were the biggest deficits that employers saw in high school graduates. Other surveys of prospective employers echo the need for qualities such as "character", sense of responsibility, self-discipline, pride, teamwork, and enthusiasm. Researchers do not deny the importance of improved academic skills. They do argue that there is more to performance on the job than formal educational background (36).

The Need for Before-and-After-School Programs for Children Between the Ages of Five and Fourteen:

Three-quarters of the mothers of school-age children work outside the home, most (70%) of them full time (37).

We do not know exactly how many children are home alone. In 1987 the U.S. Bureau of the Census estimated 7% of 5 to 13 year-olds were latchkey children; a 1987 Louis Harris poll found that 12% of parents of elementary school children acknowledged regular use of self-care. Localized studies of child care practices conducted during the 1980's show that although kindergartners are unlikely to be left alone after school, by the time children reach age 10, as many as 70% are on their own (37).

Existing before-and-after-school programs serve a small percentage of children (12%) aged 5-13 from families receiving public assistance (38).

Existing programs for early adolescents tend to serve young people from more advantaged families. They do not reach millions of young adolescents who live in low-income and rural areas. Some programs reach young people for only one or two hours a week, far less time than it takes to give sustained support (33).

Twenty-nine percent of young adolescents are not served at all by youth agencies (33).

Young people are beginning to use libraries as shelter. In many localities, libraries are used in the absence of supervised day care during non-school hours. Misuse of libraries is becoming more of a problem (33).

To date, research on the impact of the latchkey situation on academic achievement is inconclusive. Children most at risk are younger, live in inner-city neighborhoods, and are out of contact

with their parents (37).

A study of approximately 5,000 eighth-grade students found that **students who took care of themselves for 11 or more hours per week were at twice the risk of substance abuse** as those who did not take care of themselves at all (33).

The Extent and Nature of Existing Before-and-After-School Programs Serving Children in Kindergarten through Grade 8:

In 1991, approximately 1.7 million children in kindergarten through grade 8 were enrolled in 49,000 formal before-and/or-after-school programs. **Thirty-five percent of the children served were enrolled in public school-based programs.** Public school-based programs account for 28% of the total number of programs (38).

The nonprofit sector operates two-thirds of the before-and-after school programs serving children between the ages of 5 and 13; the remaining third are sponsored by the for-profit sector. Nonprofit sponsors include private nonprofit organizations (19%); the public schools (18%); private schools (10%); private nonprofit social service or youth-serving agencies, churches or religious groups (6%); state, county, or local government agencies (5%); and other unspecified nonprofit organizations (2%). For-profit sponsors include private day-care corporations (29%); for-profit schools (3%), and other unspecified for-profit organizations (2%) (38).

Seventeen percent of public school-based programs operate as partnerships with other agencies. Thirty-eight to 45% of public school-based programs indicate cooperative arrangements in the form of in-kind donations (38).

Approximately **71% of enrolled children attend programs that meet both before and after school;** the remaining 29% attend programs meeting only after school (38).

Children enrolled in before-and/or-after-school programs are overwhelmingly in pre-kindergarten through grade 3: 90% of the before-school enrollments and 83% of the after-school enrollments are in this age range (38).

In public school-based programs (regardless of sponsor), 75% of enrolled children are in grades K-3; less than 5% are in prekindergarten or grade 8 or higher (38).

A 1990 study of child-care providers found that most states have little information about the numbers of programs in their boundaries or the number of students attending them. **All but 11 states exempt public school-run programs from licensing** (38).

Almost all **programs primarily serve children of working parents and**

children who are English-speaking (38).

There are more programs and spaces available in the South (38).

For-profit organizations appear to be more responsive to the needs of working parents when school is not in session, with more than 90% operating on school holidays, school vacations, snow days etc. (38).

Few programs operate after 6 p m. (11%) or on weekends (3%) (38).

Before-school sessions average 1.8 hours and after-school sessions average 3.2 hours (38).

Across all programs, the average child-to-staff ratio is 8.9 to 1. **Public school-sponsored programs,** when compared to public school-based programs sponsored by other agencies (38):

1) **are larger,** enrolling an average of 33 versus 19 children in before-school sessions and 50 versus 36 in after school sessions, and

2) **have a higher child-to-staff ratio** (14.2 to 1 versus 10.5 to 1).

Sixteen percent of the programs serving children from low socioeconomic groups require parental involvement compared to 8% of programs serving higher socioeconomic groups (38).

Programs serving students from families with high socioeconomic status are more likely than the lower-income programs to offer both before-and-after-school sessions (76% versus 66%). **Slightly more than half of public school-based programs offer before-and-after school sessions;** the remaining programs offer only after-school care (38).

Purposes of Before-and-After-School Programs:

Activities provided on a daily basis more than 80% of the time include socializing, free time, board or card games, homework, games, reading, physically active play, block building, and free time. Activities offered at least weekly by 70% of the programs include creative arts/crafts, dramatic play, dance, music, and storytelling. Other activities offered by fewer programs include formal counseling/therapy (57% of all programs), computer games (54%), television viewing (49%), team sports (46%), skill-building sports such as track/field (44%), or tutoring (35%) (38).

Programs serving children from families with low socioeconomic status are more likely to stress purposes related to the quality of life and future success as their primary aims and offer tutoring

and homework as an activity at least weekly (38).

Financing of Before-and-After-School Programs:

The average hourly fee for combined before-and-after-school sessions is $1.77. Most parents (86%) pay the full fee for enrolling their children in the programs. (38).

Income from parental fees constitutes the largest source of revenue for programs (83%). Most of the remaining income comes from local, state, and/or federal government funds (10%), although only a third of all programs receive government funds (38).

Programs serving children from families with low socioeconomic status have a smaller percentage of parents who pay full fees (74% of parents versus 90% in higher-income programs) and are more likely to base parent fees on family income through sliding-fee scales, scholarships, or use of government subsidies (53% versus 25%) (38).

Chapter 1 funds are currently being used by only 3% of the programs nationally and only 4% of the programs that serve children from lower-income families (38).

Early Adolescents' (youth 10-15 years of age) Use of Out-of-School Time :

Only 60% of adolescents' waking hours are committed to such essentials as school, homework, eating, chores, or paid employment, while 40% of adolescents' time is discretionary (33).

A 1988 study found that 27% of eighth graders regularly spend two or more hours home alone after school. Eighth graders from families in the lowest socioeconomic group were more likely to spend more than 3 hours alone (33).

In 1990, American teenagers spent, on average, about 21 hours per week watching TV. They read for pleasure about 1.8 hours per week (33).

The importance of music in the lives of young adolescents should not be underestimated. Ninety-three percent say that music is important to them. As they move through adolescence, music replaces television as the preferred form of media. Over 90% of ninth graders report that they listen to music daily. The music reinforces peer rather than adult values. While adolescents often tend to watch television with parents, they do not listen to music with parents (34).

In 1989, seventy-seven percent of eighth graders report having used alcohol, and 26% say they have had five or more drinks on at least one occasion within the past two weeks. Alcohol use among adolescents rises directly in proportion to parental education. Usually, but not always, parental education is related to family income (33).

Approximately 30 percent of young adolescents in 1991 report having had sexual intercourse by age 15 (33).

Academic Activities Supported by Religious Organizations:

In 1991, religious congregations in the U.S. supported a large number of non-religious activities including education (86):

a) Fifty-three percent of all congregations supported non-religious educational activities. Elementary education programs were offered by 27.2% of congregations; secondary education programs by 22.3% of the congregations.

b) Larger congregations in suburban areas and large cities were more likely than smaller congregations to be involved in education activities. Tutoring and literacy programs were most likely to be offered in large cities and least likely in rural areas. Congregations in suburbs and large cities were two to three times as likely to offer day-care or pre-school programs as congregations in small cities or rural areas.

International Comparisons:

Findings Related to High School Students:

In a study of eleventh graders in the U.S., Japan and China, (147) Stevenson found the following:

1) In all three locations, the amount of time spent studying is significantly related to students' test scores on mathematics tests and to scores in both mathematics and reading in China and Japan. Furthermore, academic achievement declined in all three cultures as the amount of time students spent working, watching TV, and being with friends increased.

2) Adolescents in Japan and China, like their counterparts in the U.S. spent sizable portions of their daily lives in leisure activities, such as sports, clubs, and socializing with friends. They did not attend "cram schools" in high numbers, nor did they appear to spend all of their time after school involved with their

studies.

3) The common picture of Japanese high school students portrayed in the media is of teenagers who spend most of their waking hours after school studying. This is a more apt image of Chinese than Japanese students. If the amounts of time spent in studying, doing lessons, and reading for pleasure are summed, the average for Chinese students is 25.5 hours a week, compared to 17.2 hours for Japanese students and 15.4 for American students.

4) While 80% of American teenagers hold part-time jobs, only 26% of the Chinese and 27% of the Japanese students work at jobs outside school. Nearly all of the Chinese and half of the Japanese students who worked were enrolled in vocational high schools and worked in jobs closely related to the area in which they were receiving vocational training.

5) American students spend about 80% more time with their friends than they did studying; an average of over 18 hours a week versus 10 hours. The relative emphases were reversed for Chinese adolescents, who spent nearly twice as much time studying as they did socializing with friends. Japanese students engaged in both types of activities with nearly equal amounts of time.

6) Approximately a third of the Chinese (36%) and Japanese (34%) students, but 83% of the American students said they were currently dating someone.

7) In China, 37% of students were enrolled in after-school academic classes; in Japan 21% were enrolled in Juku, and in Minneapolis 7% were enrolled in after-school academic classes.

8) High school students in China who attended "cram Schools" spent an average of 2.2 hours a week there; Japanese students spent an average of 0.5 hours a week in "cram schools".

9) The most popular after-school class in China is mathematics, attended by 27% of the students. Many fewer American (2%) and Japanese (3%) students studied mathematics in after-school classes. The only other type of academic class in which more than 10% of the students in any city were enrolled was foreign languages; this included 15% of Chinese, 13% of Japanese and 1% of American students.

10) Although some Japanese colleges consider participation in extracurricular activities in their

decisions about admission, the more prestigious universities are less likely to do so. In Japan, only 1% of students attended 5 or more extracurricular activities; in China 11% attended, and in the U.S. 37% attended 5 or more extracurricular activities. In contrast, a third of American students attended only one or two extracurricular activities while 58% of Chinese and 83% of Japanese students did so.

11) Japanese and Chinese adolescents spend less time and money going to dances, parties, movies, concerts and sporting events than their American counterparts. Japanese and Chinese students were more likely to spend time with their friends studying or simply "hanging out". **Students estimated the following amounts of money they had available each month from their jobs and allowances: Americans: $203; Japanese: $90; Chinese: $85.**

Findings Related to Elementary School Students:

During "vacations", Asian clubs and activity groups continue to meet, and elementary school children may continue to receive homework assignments from their teachers and new academic projects are begun. **In many ways Asian students have a longer "school" year, but much of the additional time is not spent in the regular classroom** (1).

The role and function of Asian schools is clearer and narrower than American schools. Asian schools are primarily held responsible for developing academic skills and the social skills required for integration into group life; the home is held responsible for supporting the school's role and providing a healthy emotional environment for the child. Parents and teachers work together, but do not duplicate each other's roles. **Americans have turned over to the school many of the functions that traditionally have been performed by families:** education about sex, drugs, minority relations, illness, nutrition, fire prevention etc. (1).

There is strong communication between Asian parents and teachers. Elementary students each carry a small notebooks back and forth between home and school. A parent must indicate in the notebook that the child has completed the homework and may write about any general problems of which the teacher should be aware (1).

Japanese children spend as much or more time watching TV as American children (1).

More than half of Chinese elementary children read newspapers, compared to nearly one-third in Japan and one-fourth in the U.S. (1).

Services for Young Adolescents During Out of School Time:

More than 17,000 organizations offer community-based youth programs, but many of these **organizations are chronically underfinanced.** Of the 17,000 organizations, several thousand are independent. The remainder are associated with larger groups such as the YMCA or Boys Clubs of America (33).

A 1987 **survey of alumni of 4-H and other youth groups found that, on average, alumni believed that participation in the program contributed to their personal development** by giving them pride in accomplishment, self-confidence, the ability to work with others, the ability to set goals and communicate, employment and leadership skills, and encouragement of community involvement (33).

In recent years, several national agencies have established new programs for younger children, such as the Tiger Club for first-grade boys, the Daisy Girl Scouts for five-year-old girls, and the Camp Fire Sparks for five-year-old boys and girls. 4-H recently launched a new program for children ages 5-8 (33).

Surveys and focus groups indicate that **young adolescents want more regular contact with adults** who care about and respect them, more opportunities to contribute to their communities, protection from the hazards of drugs, violence, and gangs, and greater access to constructive alternatives to the loneliness they experience (33).

Only 25% of all grassroots youth organizations (not associated with national organizations) operate with annual budgets of more than $25,000. Of the grassroots organizations with annual budgets over $25,000, two-thirds report they provide life-skills training and substance-abuse programs, as well as general counseling for families, groups, and individuals. Over 40 to 50 percent offer crisis intervention, community service, academic tutoring, communications skills, peer counseling, sex education, physical fitness, and a place for youth to hang out and have fun (33).

Funding for grassroots youth organizations is as follows: 50% from government grants; 16.3% from charitable income; 7.5% from fund-raising events; 14.7 percent from fees for service; 8% from federated campaigns; 2.3% from membership dues, and 1.2% from other sources (33).

At least two-thirds of young people served by grassroots organizations are from low-income families and are defined as facing serious risks, and about the same proportion have had some involvement with the juvenile justice system. These groups serve adolescents age 10 to 18 years of age (33).

Thirty to 50% of youth report that they participate in some kind of

religious youth group (33).

Approximately 35 million youth age 6 to 18 participate in sports programs. About 6 million are enrolled in school-sponsored programs, but most participate through agency-sponsored and community recreation programs run by municipal parks and recreation departments. The highest rates of participation occurs at age 10 after which there is a steady decline to age 18 (33).

There are several large senior citizen groups that serve youth. the Foster Grandparent program, sponsored by the federal agency ACTION operates 263 projects with $60 million in federal appropriations (33) .

Science and youth museums are expanding programming for young adolescents, particularly from disadvantaged backgrounds. The DeWitt Wallace-Readers Digest Fund has established a four year, $7.1 million initiative to build the capacity of 80 science centers and children's museums. In a 1990 survey, 30% of responding institutions provided programs for youth age 10-17 (33).

Employment of School-Age Youth:

National surveys indicate that approximately two-thirds of all high school juniors and seniors hold jobs in the formal part-time labor force and that over half of all employed U.S. seniors work more than 20 hours a week (40).

Many studies of part-time employment during adolescence have shown that work in excess of twenty hours a week during the school year is associated with lower academic achievement and school involvement, more delinquency and substance abuse (40).

Adolescents who work more than 20 hours weekly are less academically-inclined and poorer students to begin with than their peers who do not work (40).

Working does not erode students' grades, despite poor attendance, homework performance and attitudes toward school. This is due to the fact that many adolescents are able to maintain their grade-point average by choosing easier teachers, selecting less challenging courses, or cheating on class tests and assignments (40).

Adolescents who later work more than 20 hours per week are likely to be less engaged in school before they started working. However, taking on a job for more than 20 hours weekly further disengages youngsters from school, increases delinquency and drug use, furthers autonomy from parents, and diminishes self-reliance (40). Leaving the labor force after working long hours leads to improved school performance but does not reverse the other negative effects.

Extracurricular Activities:

The perspective one takes about extracurricular activities varies with the values and goals one has for schools. Value positions have either an academic or developmental perspective. The academic perspective views the purpose of schools as the pursuit of academic excellence and the development of knowledge. The developmental perspective supports school programs that further the development of the total child. Before the 1980's (and especially in the 1960's), our societal rhetoric focused on the developmental perspective. Since then, the rhetoric has focused more on the academic position (154).

Participation in extracurricular activities may lead adolescents to acquire new skills (organizational, planning, time-management), to develop or strengthen particular attitudes (discipline, motivation), or to receive social rewards that influence personality characteristics (154).

Research indicates that participation in extracurricular activities, including both athletic and non-athletic activities, is associated with desirable personality and social characteristics such as self-esteem, educational aspirations, feelings of control and lower levels of alienation. However, the research does not demonstrate convincingly that participation causes such desirable outcomes. Participants and nonparticipants select themselves into or out of extracurricular activities. Preexisting personality and social differences between participants and nonparticipants may account for the correlations (154).

The relationship between participation and desirable outcomes seems to be stronger for male adolescents from lower SES families and of lower academic ability. For example, lower SES boys who participate in athletics are more likely to have higher educational aspirations that lower SES boys who do not participate; for higher SES boys, the differences are greatly reduced (154).

Nonformal education refers to organized, systematic teaching carried on outside the formal school system. Nonformal education programs include summer camp, after-school clubs such as 4-H and Boy Scouts, music and art instruction, tutoring and counseling services, religious programs, youth clubs, sports and recreation programs. There is evidence that today's students are receiving less nonformal education. For example, between 1965 and 1980, Catholic, Jewish and Presbyterian programs all reported drops of 40-50% in youth participation in nonformal education, despite the fact that overall church membership stabilized. With the exception of educational programs on television, it appears that mostly upper-middle and upper class students benefit from nonformal education. Because resources are needed for access to much of the

non-formal education, until recently the poor have participated primarily in extracurricular programs in schools. The renewed emphasis on academics in schools, however, along with the increased limitations on school funding has resulted in the reduction of extracurricular opportunities through schools (41).

RESEARCH-BASED OBSERVATIONS

In thinking about out-of-school use of time, we are concerned with approximately a seven hour period each day - from roughly 3 pm until 10 or 11 o'clock at night. **The questions to be addressed are: How much freedom should children have?; How much supervision?; How much responsibility?**

All educational systems which have a strong public examination system also have coaching and cramming institutions. Skillbeck believes that all European systems have cram schools, although they are not as formalized as the schools in Japan. There is very little national or international data on the private sector of education (81).

One of the most important findings of research on two to five year olds is that the **children who benefit most from child-care centers are those who come from relatively poor families.** The rich experience at the center contrasted with the impoverished setting at home and provided children with opportunities they otherwise would have missed (33).

Early adolescents spend little time with their parents, and parents do not determine how young adolescents spend their time as they do with younger children (34).

Adult and child perspectives on appropriate uses of time outside of school often cause disagreements, anxiety, and frustration (34).

There have been few studies of how young children fare in after-school care, although there is some evidence that latchkey children, who must care for themselves after school, tend to have problems. **Limited data suggests that children can benefit from high-quality after-school programs** that involve communication between teachers and caregivers, and activities that complement the regular school program (41).

In serving the poor, social service agencies emphasize "social control." In serving the middle class and wealthy, the emphasis is "opportunity enhancement." The former represents one of the most enduring objectives of out-of-school services - to curb delinquency and diminish the likelihood of socially destructive behavior by instilling middle class values. In contrast, opportunity enhancement assumes that children are growing up properly and need opportunities to explore, improve and expand their skills and

capabilities (34).

The beliefs behind the nation's approaches to youth services is a fix-then-teach philosophy - the idea that students must be fixed or made ready for learning - problems must be addressed. This approach fosters passivity. It assumes that families and schools, without additional support, can naturally prepare our youth as productive adults. The existence of major problems among our youth indicates that what schools and families naturally do in the 1990's does not work sufficiently. **If we cannot change the nature of families, schools and other social agencies need to identify and set in place a set of supports/services that will help today's students develop the skills, knowledge and attitudes they need as they move through school. Not to do so is to be left with expensive problems to fix after the fact** (44).

There has been little research on school-age child care, particularly in terms of what kind of program has a positive impact on students social or academic development (37).

Child care centers that in earlier years served mostly preschoolers have become increasingly involved in school-age child care (37).

Although the quality of programs appears to be improving, it is uneven. Staff-child ratios and other elements that constitute good programs vary widely from state to state. **Too few programs amount to little more than organized baby-sitting** (37).

Most researchers agree that the negative consequences of employment are linked to how much, not whether, a student works (40).

Circumstances shape an adult's sense of what is possible, thereby influencing his or her attitude toward time as well as toward children's use of time. Whether opportunities seem limitless or limited affects people's view of time use. For example, for the male child born into a professional middle class family, the sky is the limit, and he begins early to make plans for his future. For the disadvantaged male, the experience is just the reverse. **Messages coming from parent to child about time use are, in part, a function of whether parents believe they can manipulate their child's environment advantageously.** It is reasonable to plan and prepare for the future if success seems likely. The likelihood of success becomes a factor influencing how time is valued. For many disadvantaged people, the time-bound, regularized world of the middle class makes no sense (95).

The idea of harnessing out-of-school time for educational support means creating a time-use environment and not just having parents adhere to a checklist of activities that children should do. **Increasingly parent time is at a premium.** In many families, even the most basic tasks of household upkeep are performed under pressure. **In the future parents may have a greater impact on their**

children's attitudes toward out-of-school time than on actual time use decisions. In an era of diminishing parent time, the values about time use that adults convey to children will matter a great deal (95).

HOMEWORK

THE CHARGE:

To conduct an analysis and make recommendations regarding the time spent on homework, how much of that time is spent on academic subjects, the importance that parents and teachers attach to homework, and the extent to which homework contributes to student learning.

Note: Around 1910, the Ladies Home Journal and School Review opposed homework, because it was unsupervised and allowed children to practice mistakes. Furthermore, the children had to carry their school books home, which some suggested was an unhealthy practice. During the Vietnam War years, homework also was not favored, because it was perceived that it put undue pressure on students (124).

Amount of Time Spent:

Historically, students in the U.S. have been asked to do little homework. Researchers have found that from 1930 to the early 1980's few students had to study more than 1 or 2 hours a week outside school (118).

The National Assessment of Educational Progress (NAEP) reports the amount of time students spent doing homework in 1990 as follows (119):

> 1) **At age 9, 82% reported doing one hour or less of homework a day.** Specifically, **thirty six percent of students reported doing no homework**; 5% reported that they did not do the assigned homework; 46% reported doing less than 1 hour; 12% reported doing one-two hours and 6% reported doing more than 2 hours per night.
>
> 2) **At age 13, 58% of students do one hour or less of homework a day.** Specifically, **21% do no homework**, 5% do not do assigned homework; 37% do an hour or less; 28% do one to two hours and 8% do more than two hours per day.
>
> 3) **At age 17, 51% of students report doing an hour or less of homework a day.** Specifically, **22% report doing no homework**, 13% do not do assigned homework; 28% do less than one hour; 25% do one to two hours and 12% do more than two hours per day.

A study of 3,700 first, third, and fifth grade teachers in 600 schools, the time students spent doing homework daily ranged from

none (13% of students), to 15 minutes (21%), 30 minutes (36%), 45 minutes (13%) and one hour or more (17%). In other words, **well over half of the first, third, and fifth grade students spent 30 minutes or less on homework per day** (110).

A 1991 federal report revealed that 71% of high school seniors only spend one hour on homework per night (174).

A study (118) of 3,000 teachers **in 92 Illinois high schools** found:

1) **decisions on homework are established by default:** only 31% of school districts, 24% of high schools, and 18% of individual departments had homework policies [This finding is consistent with other surveys (124, 125)];

2) **there is not consistency among teachers in assigning homework:** 85% of teachers assigned homework; 14% did not;

3) **the average teacher assigned 30 minutes of homework slightly less than 4 times a week.** In total, teachers assigned about 2 hours of homework per class per week, or assuming five classes per day with homework expectations, approximately 2 hours of homework per day - about 30 minutes more per day than high school students in California;

4) **about half of the teachers reported that students completed between 81% and 100% of their homework;** one third said the completion rate was between 61% and 80%. Teachers also noted that there was a group of about one-fifth of the students who competed less than 60% of their homework;

5) **reasons students gave to explain their failure to complete assignments was that they forgot (40%), they did not have enough time (19%), they did not understand the assignment (11%),** they had to work (9%), they chose not to do it (7%), and there were too many other assignments (6%).

6) **88% of teachers graded homework;** 97% of the teachers who graded homework computed the marks into semester grades to the following extent: 11% of teachers counted homework for 50% of the grade or higher; 7% of the teachers counted homework for 40% of the grade; 6% for 35% of the grade; 8% for 30% of the grade; 15% for 25% of the grade; 18% for 20% of the grade. **Nearly half of the teachers counted homework for 25 or more percent of the students' total grade.**

International Comparisons:

The real difference between American and Japanese homework has to do with the ways in which Japanese teachers train students to view and work with homework. The Japanese have three different words for homework:

a) "Shikudai", which refers to homework **assigned by teachers** to students, much in the same way as American teachers assign homework.

b) "Fukushu", which refers to the **ongoing practice of reviewing** what has been covered in class to insure that students are ready for tests. Review for Japanese students is an ongoing process.

c) "Yooshu", which refers to the practice of **previewing** or reading at home what the teacher is going to deal with the following day or week (6).

Three months before students begin school, teachers ask parents to set aside a specific time each day for homework. **Every day at the same time the preschool students sit down and do their homework,** which consists of writing their name on a paper ten times. All of the papers are kept chronologically in a notebook. Parents periodically tell their young children how much progress they are making in writing their name. This process is used to **develop the habit of homework and to see the value of it,** before students start school. In school, students learn how to keep notebooks of all their work, how to take notes etc. (6).

The National Center for Education Statistics surveyed countries regarding the percent of 9 and 13 year-old students with two or more hours of homework per day. They report the following:

1) **20% of 9 year old students in the U.S. do two or more hours per day (Note that NAEP found, only 6% of 9 year-old students do two or more hours of homework per day). The average percent of students among all 10 countries surveyed that spend 2 or more hours per day is 23.9.** The percentages of students in the 10 countries that do 2 or more hours of homework per day range from 13% (Canada) to 35% (Israel).

2) **29% of 13 year old students in the United States do 2 or more hours per day of homework. The average percent of students who do 2 or more hours of homework a day among the 15 countries surveyed is 45%.** The percentages of students in the 15 countries that do 2 or more hours of homework per day range from 14% (Scotland) to 64%

(Spain). Of the 15 countries surveyed, only three (Scotland, Slovenia, and Switzerland) had a fewer percent of 13 year-olds than the U.S. who did 2 or more hours of homework a day.

In a study of ten countries (Canada, Britain, Israel, France, New Zealand, South Korea, Germany, Taiwan and Japan), researchers conclude that **time spent on homework in the U.S. is substantially less than other countries** (82).

Asian teachers assign large amounts of homework and Asian children devote significant portions of their time to getting it done. **Mothers' estimates of the time spent on homework by Japanese first graders were three times as high, and for Chinese children, seven times as high, as those for American children. Fifth graders in America were found to spend slightly more than four hours a week on homework - significantly less than the six hours in Japan and the 13 hours in China** (1).

Homework is assigned to Asian children not only during the school year, but during the rest of the year as well (1).

Homework as Effective Use of Time:

A review of 15 studies of homework showed that assigning and grading or commenting on homework has three times as much effect on achievement as family socioeconomic status (168).

Overall, the effect of homework on achievement is above average when compared with some other strategies for improving achievement. For example, meta-analyses have shown that homework has a more positive effect on achievement than individualized instruction, amount of television watching, praise, or special versus regular class placement. It is less effective as a strategy than using higher cognitive questions and advanced organizers in instruction, direct instruction, and cooperative learning (112).

Because homework requires that students spend additional time on academic material, some researchers have examined its effect compared to having students devote a similar amount of added time at school. **When homework and in-class study were compared in elementary school, in-class study proved superior. In junior high, homework was superior, and in high school the superiority of homework was most significant.** Since the number of studies in this area is small (10) and the methodologies qualitatively different, these findings should be viewed only as suggestive (112, 117).

Equity Issues Surrounding Homework:

A small study of homework given to children in 10 integrated schools, 10 magnet schools and 10 predominantly minority elementary schools in Chicago found that:

1) **students in predominantly minority schools (85% non-white) reported doing less homework in math, science and social studies than students in magnet schools (65%-85% non-white) who in turn do less homework than students in integrated schools (40%-70% non-white);**

2) **in schools with higher proportions of students who receive free lunch (poorer schools), students report spending less time on homework in math and social studies than students from schools with a lower proportion of low-income students;**

3) **in schools where fifth grade achievement in math and social studies is lower, students report doing less homework in math and social studies than students from schools with higher previous achievement,**

4) **educational opportunities are unequal among the different kinds of schools, because students in the lower-achieving, poorer, and predominantly minority schools get less homework,** which would help to promote increased achievement.

A study (118) of 3000 teachers in 92 Illinois high schools found that **homework is not assigned equitably:** 98% of teachers with college preparatory or advanced placement courses assigned homework; 77% with vocational classes and 83% who taught in the general track.

Factors Related to the Effectiveness of Homework:

The vast majority of parents of 8th graders report having family rules about homework. In 1988, **a larger percentage of relatively poor than relatively wealthy parents reported having established family rules about doing homework:** 92.2% of parents from the lowest socioeconomic quartile reported having such rules; 93% of parents from the middle two socioeconomic quartiles, and 89.9% of parents from the highest socioeconomic quartile. In addition, 92.2% of two-parent families and 91.2% of single parent families reported having such rules (120).

The major differences regarding parents and homework were related to the percent of parents who helped their students with homework;

41.7% of parents from the lowest socioeconomic status (SES) group reported that they never or seldom helped with homework; 27.5 of the middle two SES quartiles, and 21.9% of the highest SES quartile. In two-parent families, 27.6% reported they never or seldom help with homework; in single-parent families, 36.2%. (120)

Although common sense dictates that some monitoring of homework is important, **there is no research that feedback or homework evaluation by the teacher affects student performance** (112).

Homework's effectiveness is influenced by a number of complex factors that rarely have been examined by researchers (109). Factors that are believed by some to be important, include the effects of student motivation, the effects of study skills, the question of whether some students need more time than others for homework, the relative effectiveness of alternative strategies for more closely integrating homework into classroom instruction, the relative benefit of homework as individual or group projects, the importance of providing materials necessary to carry out assignments, and the effects of physical surroundings provided to the student doing homework (112).

The costs and benefits of time spent on **different kinds** of homework assignments are not known. Yet, we do know that homework is not cost-free. **Homework costs teachers when they use planning time, class time, or personal time to prepare, explain, correct, and comment on homework assignments. Inappropriate homework costs students if it is boring, frustrating, or repetitive of skills already mastered** (109).

While homework can be used for a variety of purposes including building student responsibility, honesty, and time management or increasing the active involvement of the student with learning, **most teachers say they assign homework to give students time to practice skills learned in class** (110, 118).

A study (118) of 3000 teachers in 92 high schools found that **half of the teachers chose textbook and questions as the most commonly used type of homework assignments. An additional 25% selected worksheets**, 7% gave essays and writing assignments, 5% gave reading and research projects and 4% gave independent projects.

Homework Effects on Achievement at the Upper Elementary (Grades 4-6) and Secondary Levels:

The effects of homework on student achievement in grades K-3 have not been studied (112).

The effects of homework on student achievement among children in the upper elementary grades is controversial. The relationships

(correlations) reported in research between the amount of time a student spends on homework and achievement may have different meanings at the elementary and secondary level. Parents tend to be more involved with their children when they are in elementary school, and children and their parents spend more time working on needed skills. Somewhere between the elementary and junior high school years, the philosophies of the schools, the students, and their parents change. At the secondary level, brighter students receive more homework and spend more time on it while slower students tend not to work long on what they do not understand (110).

Most research on homework has been conducted at the secondary level, where it has been shown to be positively associated with academic performance and student behavior (110) (112). One high quality study found that the homework had a significant effect on grades. For example, students with high learning ability who did no homework earned mostly B grades, while those who has 10 hours or more of homework per week earned grades of A and B. Students with low learning ability who spent 10 hours per week on homework received mostly B grades, while those who did no homework performed in the B and C range. Grades of low-ability secondary school students who did 10 hours or more of homework per week were as good as the grades of high-ability students who did no homework (111).

Cooper found similar positive results for secondary level students. His describes his findings as follows:

> Let's assume a hypothetical teacher teachers two classes of 25 students and...each student in one class has an exact counterpart in the other. Assume further that the teacher uses the same instructional methods in both classes to teach a 10 week unit, except that one class takes home about a half-hour of homework three times a week. These studies revealed that, if the teacher is teaching high school students, the average student in the homework class would outperform 69% of the students in the no-homework class. Put differently, the student who ranked 13th in achievement in the homework class would rank 8th if he or she were shifted into the no-homework class at the end of the unit. If the teacher teachers junior high school, the average homeworker would rank 10th in the no-homework class (117, p. 88).

Junior high student achievement increases with the amount of homework completed up to two hours a night where the positive effects level off. The more time high school students spend on homework (within reason), the better they do (112).

The research shows that elementary school students who spend more time on homework and get more help from parents have lower achievement scores in math and reading than students who spend less

time on homework. Some researchers argue that children who are doing well in elementary school spend less time and need less help from parents than do weaker students. In addition, elementary schools are likely to assign the same homework to the entire class or students. **Completing that homework takes more time for slow students than for their peers** (110). Other researchers argue that homework at the elementary level is not individualized. Therefore, **high ability elementary students may be assigned homework that is not challenging, and doing the homework does not enhance academic performance. Low ability students may be assigned homework that is too difficult for them to master. Spending hours on homework they do not understand does not increase their academic performance** (121).

The Pelavin Briefing Paper presented the conclusions of Harris Cooper (112), whose analyses of homework studies suggested that there is no evidence of homework being linked to achievement at the elementary level. Cooper suggests, however, that this finding be viewed cautiously for the following reasons:

> 1) His conclusions about the amount of time students should spend at the elementary level were based on an analysis of only 13 studies (115);
>
> 2) In the elementary studies, students spent very small amounts of time on homework (approximately 20 minutes to a half hour), which makes it difficult to distinguish the effects of different amounts of time. At the high school level, researchers are comparing the difference between larger blocks of time (e.g. the difference between a student who does a half hour versus a student who does two or three hours). At the elementary level, researchers are trying to compare the difference between 10 minutes versus 30 minutes (115).

At the elementary level, hours of TV per day are not correlated with math or reading skills. **There is also no association of mother working outside the home with math or reading achievement, homework completion, or classroom behaviors** (110).

The Quality of Research on Homework:

Leading researchers who have analyzed studies of homework have agree that **the quality of research on homework is poor and findings are contradictory.** The problem is succinctly described by Cooper (112) who says:

> The research design used most often to assess the possible effects of home study is to correlate the amount of time students spend on homework with how well they are doing in school...**The problem is in interpreting what the**

> **resulting correlation means. If time spent on homework and achievement prove to be positively related, does this mean that homework improves school performance, or does it mean that teachers assign more homework to better students. If the relation is negative, does homework have a detrimental effect on performance, or do brighter students simply finish assignments in less time** (p. 91).

There are many examples of **conflicting interpretations of data.** Cooper (112) and Marshall (113) meta-analyses conclude that homework has little effect at the elementary level, while Keith (111), Pascal, Weinstein and Walberg (114) conclude that homework does have a positive effect on achievement at the elementary level.

RESEARCH-BASED OBSERVATIONS

We know that children in other countries spend more time studying outside of school than students in the U.S. However, **it is important to make a distinction between the learning environment associated with homework and that which students experience in cram or other kinds of private sector schools operating after the regular school day. In the cram schools, students work actively and directly with teachers. They receive instruction tailored to their needs, much in the same way a student might receive instruction in this country if the length of the school day or year were extended.** This kind of instruction is qualitatively different than "homework", which typically is not tailored to the individual student and is usually completed by the student without the assistance of a teacher (115).

Different amounts of homework may be appropriate for different students. It is important to give students what they need rather than set an arbitrary number of minutes of homework for all students (115).

The assignment of homework to school-age children is the norm in European countries from an early age (81).

If the U.S. wants to close the current gap in time spent learning, them a stiffer homework policy must be implemented (81).

Middle and upper class parents generally support homework for their children. The children of lower-class parents often lack this support (81).

Homework seems to be most effective when it is viewed as a positive out-of-school learning opportunity. This is the case when teachers 1) plan out-of-school learning that will expand and enrich the curriculum, rather than confining homework to more of the same, 2) use homework to provide opportunities for students to think

critically about how some of the ideas learned in school apply to their lives out of school, 3) use homework to help students better understand their own backgrounds and life experiences, and 4) provide opportunities to involve parents and other family members (123).

PROFESSIONAL DEVELOPMENT OF TEACHERS

THE CHARGE:

To conduct an analysis and make recommendations concerning year-round professional development opportunities for teachers and how teachers can use their time to acquire knowledge and skills that will permit them to improve their performance and help raise the status of the profession.

Note: Although the charge focuses on continuing year-round professional development for teachers, which would logically occur after the preservice phase of professional development, data on preservice education also are provided. The Commission may or may not want to make recommendations about preservice education.

General Findings:

In a 1985-86 survey of 178 urban high schools enacting major change, **more principals (88%) named lack of time as a major or minor problem than named fiscal resources (76%) as a major or minor problem.** The survey also showed that, on average, each participating teacher devoted 70 days over a 3-4 year period to the project. The more successful schools used 50 days a year of external assistance for training, coaching and capacity-building. **Estimates of time required made by the Effective Schools Network, which helps schools develop and implement improvement plans, add up to time commitments of 10 to 20 teacher days per year** (45).

A survey of high school teachers found that **46% of teachers spend less than one hour a month meeting with colleagues on curriculum and instruction.** Another 30% spend between one and five hours per month planning (46).

Six **approaches for creating time for teachers professional development** have been identified (45):

1) promoting time outside the classroom during the school day through the **use of substitutes, the use of university faculty and students as teachers, the use of parent and community volunteers, and the use of other school personnel** such as principals, teacher aides, and peer mentoring,

2) using existing time, such as that scheduled for **faculty meetings and district-wide staff development**, for teacher collaboration,

3) **rescheduling the school day** by a) adjusting the master schedule to support teaming and block scheduling, or b) banking time (e.g. using homeroom time or adding minutes of classroom time to certain days) to permit dismissal of students for other blocks of time,

4) increasing the amount of time available through **longer school days or years**,

5) promoting **use of teachers free time**, and

6) promoting **more efficient use of time** through time-management techniques, and technology.

There is a body of research that shows that the **content currently taught in classrooms is tedious, boring, repetitive and intellectually empty** (51).

One study suggests that it is not enough to simply give teachers additional time. **There must be a clear understanding of the purposes for which the additional time is to be used** and, if appropriate, teacher training in skills to make effective use of the additional time (47).

There is extensive research stressing that **the best teachers stay in teaching because of intrinsic rewards**, such as pride in one's work or the belief that a child can learn. **Incentive policies in the past have been based primarily on extrinsic rewards** and directed at the individual. Merit pay and career ladders are two examples of extrinsic reward systems (48).

Elementary teachers in the U.S. spend an average of 49 hours per week on teaching duties; secondary teachers spend 46 hours per week (87).

In a study of ten countries (Canada, Britain, Israel, France, New Zealand, South Korea, Germany, Taiwan and Japan), researchers conclude that **teachers in the U.S. appear to have more education than other nations**, particularly at the elementary level. Respect for teachers appears to be greater in other countries (82).

Veteran school teachers report **significant differences in the skills and attitudes of students entering schools today compared with 10 or 20 years ago.** Students have many more problems, less support from the home and community, and increasingly exhibit dysfunctional behaviors such as drugs, gangs and pregnancy. Over one-third of teachers responding to one survey believe they are unsuccessful in teaching the students in their classrooms (49).

Collective Bargaining:

Collective bargaining takes place only within a fairly well-defined framework of issues such as salaries, fringe benefits, and preparation time. **It is reactive and treats the basic parameters of school organization as sacrosanct.** This fact represents an historical limitation of trade unionism in obtaining structural change in schools (101).

Teachers' Perspectives:

A 1993 national survey of teachers' opinions (126) found:

1) **86% of teachers think that parents should be penalized through fines or some other mechanism if they allow their children to be chronically truant.**

2) teachers give strong support to establishing standards for students - **80% support (including 42% who strongly support) requiring eighth graders to pass an exam to going on to high school;**

3) **81% of teachers support (including 40% who strongly support) establishing national standards for what students should know;**

4) **73% of teachers support expanding alternative certification methods** for people who want to take up teaching as a second career;

5) **72% support differential pay** to attract and retain teachers who work in urban schools or school in isolated or rural areas.

6) **69% of teachers believe that the federal government's highest priority should be programs helping disadvantaged parents work with their children to encourage learning -** strongest support comes from black teachers and those who work in inner cities and elementary schools;

7) **69% of teachers strongly support developing a national apprenticeship program** for non-college bound students.

8) **61% of teachers believe there should be differential pay for those who teach math and science.**

Preservice Education:

Currently, **only 40% of colleges of education have been professionally accredited** by the National Council for the Accreditation of Teacher Education (50).

A 1993 public opinion poll conducted by the National Council for Accreditation of Teacher Education found: 1) **82% favor requiring teachers to graduate from nationally accredited professional schools; 2) 78% favor national accreditation standard for schools of education; 3) 83% favor higher salaries for teachers trained in professional schools that meet national accreditation standards; 4) 73% favor local schools hiring only teachers who have been trained according to national standards** (50).

There is a body of research that shows that **students in teacher education programs do not have lower intellectual ability** than individuals who enter other professions (52). A 1990 nationwide survey showed that 87% of college of education students were in the top one-third of their high school classes (53).

In their 1987 survey of reforms in teacher education, the American Association of Colleges for Teacher Education found that **73 percent of the responding institutions were involved in raising admission standards; 52 percent reported changes in liberal arts curriculum requirements for preservice teachers; 51 percent were using public school teachers as teacher educators** (60).

There is a body of research showing that **liberal arts courses are not designed to leave students with an integrated, conceptual understanding of subject matter.** Instead, liberal arts courses teach facts and lower-level cognitive operations (54).

State Standards for the Second Stage of Teacher Certification:

In 1991, **thirty states required a second-stage teaching certificate (i.e. an advanced or professional certificate that comes after the initial teaching certificate) compared to thirty-five states that required such a certificate in 1987.** Twelve additional states offer, but do not require a second stage certificate (55).

In 1991, the **requirements for a second stage certificate varied across the states** as follows (55):

a) Eight states required an internship compared to six states in 1987,

b) Thirty-three (compared to 32 states in 1987) require teaching experience for either one year (5 states), two

years (12 states), 3 years (14 states), or five years (2 states).

c) Five states require re-employment as one of the requirements.

d) Two states require a fifth year of study while two other states require a fifth year **or** a masters degree **or** 30 semester units.

e) Thirteen states require a master's degree. In three of those states, the masters degree requirement can be met with a specified number of semester units and in two states, the masters degree requirement can be met with a fifth year of study or 30 semester units. One state's requires a master's degree that includes 12 to 15 semester hours in specific coursework.

f) Nine states not requiring a master's degree have other requirements: 2 states require 6 semester units and 3 years of teaching experience; 2 states require 30 semester units and 3 years experience; DC requires a course in computer literacy; Missouri requires completion of the employing district's professional development plan and 2 years teaching experience; New Hampshire requires 50 clock hours of staff development and 3 years of experience; Michigan requires 18 semester hours and three years experience; Pennsylvania requires 24 semester units and 3 years experience.

g) Two states require the passing of an exam for the second stage certificate.

h) Fifteen states report that local assessment is one of the requirements for the second-stage certificate.

State Standards for Continuing Education (i.e. education after the teacher has reached the final formal stage of certification in a state, whether the final stage is the certification received after preservice training or after a second stage of certification as is required in 30 states) (55).

In 1991 forty-two states (compared with thirty nine in 1987) have continuing education requirements (55).

The trend is to eliminate permanent certificates and develop continuing education requirements. In 1992 nine states (compared to 16 states in 1987) issued some form of permanent/life certificate (55).

One state, Connecticut requires continuing education for renewal of

a third stage certificate (55).

Teachers are generally required to renew their certificate every 5 years. Thirty-one states require transcript credit as a condition for renewal. The number of credit varies from 6 semester hours (required in 21 states); 9 semester hours (required in 2 states); 8 units (required in two states); up to 15 semester hours (required in one state) (55).

In 1991, **39 states (compared to 33 states in 1987) have authorized colleges to provide continuing education.** In 9 states the college is the sole agency authorized to provided continuing education. **In 30 states the local school district is authorized to provide continuing education.** In 15 states, the state education agency provides continuing education (55).

In 30 states, the state education agency is authorized to verify completion of a component of continuing education. In 22 states, the school district can verify completion. In 6 states, the institution of higher education can verify completion (55).

In 36 states, all or part of the funding for continuing education comes from the individual. In 27 states, all or part of the funding comes from the school district. In 13 states, all or part of the funding comes from the state education agency. In 10 states, the funding comes from all three sources (55).

Forty-one states indicate that the state is not increasing continuing education requirements (55).

International Comparisons:

The training of teachers in the U.S.takes place almost entirely in colleges and universities. **The real training of Asian teachers occurs in their on-the-job experience after college through a kind of apprenticeship program.** In Asia, there is a systematic effort to pass on the accumulated wisdom of teaching practice to each new generation of teachers by providing for continuing professional interaction of teachers. By Japanese law, beginning teachers must receive a minimum of 20 days of in-service training during their first year on the job (1).

In Japanese and Chinese elementary schools, a large room in each school is set aside as a teacher's room, and each teacher is assigned a desk in the room. Here they spend their time preparing lessons, correcting students' papers and discussing teaching techniques (1).

In Japan, teachers salaries are 2.4 times the national per capita income, as opposed to 1.7 times for teachers in the U.S. (1).

Japanese elementary teachers are in charge of classes only 60% of the time they are at school. Chinese teachers taught three hours a day unless the teacher is a homeroom teacher in which case the total is four hours (1).

Large amounts of non-teaching time is available to Asian teachers for two reasons. First, class size is bigger. By having more students in each class, all teachers can have a lighter teaching load. Time is freed up for teachers to work together on a daily basis and prepare lessons. Although class sizes are large, the overall ratio of students to teachers within a school does not differ greatly from the U.S. **Second, Asian teachers spend more hours at school each day** (over 9 compared to 7.3 for American teachers.) The longer school day gives Asian teachers a chance to provide additional help to students who need it (1).

Elementary school teachers in Japan stay with the same group of students for two or three years. They also rotate periodically through all six grades of elementary school and, every three to seven years, rotate from school to school within the city. They are, therefore, exposed to new challenges, new ideas, new colleagues and new sets of parents (1).

RESEARCH-BASED OBSERVATIONS

There is disagreement in the literature about whether teaching can ever become a profession and whether focusing on teacher professionalism will lead to improved teacher performance. Some researchers point to the fact that **the focus on professionalism,** which has been the primary strategy to improve teacher performance during the last two decades, **has not had an impact.** They argue that we should focus directly on teacher performance leading to improved student learning (56).

Prospective teachers, even those with four years of liberal arts education do not appear to have the kinds of content knowledge needed to implement the developing curriculum frameworks. At some point in their preparation, time and structures must be provided for teachers to learn both the content and how to teach it (57).

The research and literature on school-based management provides little evidence of positive outcomes, particularly increased learning for students. This may be due to 1) the fact that actual control over budget, program and staffing are often not transferred to the school site in any substantial way, 2) schools lack the organizational capacity to implement school-based management, 3) schools lack the support needed to make the change to school-based management, 4) time has not been available to make school-based management work as it was intended, and 5) appropriate reward systems for teachers have not been established. (Although the formula for making school-based management work has not yet been

developed, there is information to guide recommendations the Commission might make should it decide to move in that direction) (58).

Adding the task of school reform to the list of things schools are required to do reduces the amount of time for other required tasks. School need to determine what policies and practices do not contribute to their mission and abandon them; new priorities must be established and more time must be provided to plan and monitor the changes (59).

A recurrent theme of reform studies is that **change takes longer than anticipated.** Most foundations offer 3-5 year grants and some have concluded that 5-10 years might be more realistic (45).

One estimate of a moderately difficult teaching strategy could require that teachers receive 20 to 30 hours of instruction in its theory, 15-20 classroom demonstrations, and 10 to 15 coaching sessions before mastering the technique and incorporating it into routine classroom practice (45).

Current reforms are aimed at strengthening the school as a whole. **Traditionally, staff development activities focused on upgrading the skills of individual teachers; now they stress collegiality and peer coaching** (45).

Frequently noted in case studies of reform effort is **the importance of process skills for teachers.** Repeatedly, it has been found that teachers need, but are often not provided with the time for, training in conflict resolution, communication, participatory decision making, and problem solving. In designing change strategies, planners should look not only at the reform itself but at what assumptions have been made about the skills needed to implement it (58).

Many teachers are likely to agree with the reform idea in the abstract, but in practice, are likely to question the wisdom of practices such as spending an entire class on one problem (too inefficient), or engaging students in a complex discussion of a topic (it confuses them) or of engaging students in experimentation (it leads to misbehavior) (100).

Reformers want to create learning communities where students work with and challenge ideas while conventional wisdom defines good teaching as reinforcing the right answers and correcting the wrong answers (100).

Prior reform efforts and research clearly demonstrate that **teachers have their own views about teaching which are stable and resistent to change** (100).

Most contemporary policy (curriculum frameworks, incentives)

increases control over teaching. **No current initiative is based on the belief that teachers lack the knowledge or other personal resources they need to change their practice.** Instead, policies assume that teachers, deep down, know how to do this, but for some reason are either constrained from doing it or are not motivated (100).

In Britain, all universities that prepare teaches are required to make the K-12 school site the locus for about 30% of teacher training. Portugal and Spain place a strong emphasis on the apprenticeship element of teacher education. Responsibility for teacher preparation is shared between the schools and universities (81).

SCHOOL FACILITIES

THE CHARGE:

To conduct an analysis and make recommendations concerning how school facilities are used for extended learning programs.

RESEARCH FINDINGS:

Note: The staff is in the process of collecting information about a range of extended learning programs and analyzing a number of issues, including the use of facilities. To our knowledge, this type of analysis has not been conducted by anyone in the past.

In the U.S., we believe that high levels of academic achievement are possible only in modern, well-equipped schools. **Asian children attend schools that are crowded, poorly heated and spartan** (1).

A MODEL PLAN FOR ADOPTING A LONGER ACADEMIC DAY AND YEAR

THE CHARGE:

To conduct an analysis and, if appropriate, develop a model plan for adopting a longer academic day and academic year for use by U.S. elementary and secondary schools by the end of this decade, including recommendations regarding mechanisms to assist States, school districts, schools and parents in making the transition from the current academic day and year to an academic day and year of longer duration.

Note: The only research reviewed to date on this topic deals with year-round schools.

Year-Round Education (YRE):

Recent increases in YRE have been due to increases in **single-track programs which now account for over 50 percent of all YRE programs** (61).

While YRE was once seen as a means to save money, it is **increasingly being viewed as a means of improving academic performance** (62).

There is evidence that **the three-month summer break results in learning loss for disadvantaged students. It is unclear whether advantaged students suffer learning loss over the break** (63, 64, 65, 66, 67).

There is not yet any evidence that learning retention increases in YRE programs (62, 68).

Analyses of student achievement in YRE programs find, **with one exception (69,), that there are no significant differences in student achievement in year-round and traditional calendar program** (70, 71).

Students, parents, teachers and administrators involved in YRE tend to view them favorably, citing greater learning retention, less teacher burnout, improved student attendance, and job opportunities (62, 63, 66, 68, 69).

Currently, **there are 52 different configurations for schedules in YRE programs** across the country (61).

COSTS/SPENDING IN EDUCATION:

THE CHARGE:

To conduct an analysis and estimate the additional costs, including the cost of increased teacher compensation, to States and local school districts if longer academic days and years are adopted.

Note: The paper developed by Larry Picus, which is being sent to Commissioners has addressed this issue. Other information related to the costs of education is provided in this section as a backdrop for thinking about cost issues.

Per-pupil expenditure is higher in the U.S. than in France, Britain, New Zealand, Germany, and Japan (82).

The claim that the U.S. spends more than other nations on education is misleading. By most comparisons, **the U.S. devotes a smaller share of its resources (GNP) to pre-primary, primary, and secondary education than do most industrialized countries.** For example, if the U.S. had put forth the fiscal effort commensurate with that of Canada, the elementary and secondary school funding for 1990 would have increased by over $39 billion (175).

While the expenditure per pupil is high in the U.S. compared to other countries (e.g. the U.S. ranked fourth in expenditure per pupil in 1985 behind Switzerland, Sweden, and Canada), naked dollar per scholar comparisons do not accurately depict the relative educational burdens undertaken by various countries. **When the diversity of educational needs are taken into account, the U.S. is found to have more weighty educational cost burdens than other countries with comparable economies.** One extenuating circumstance is the economic plight of the children attending school. Another is the increasingly racial, ethnic, cultural, and linguistically heterogeneous population. The more diverse the population the greater the costs (175).

Approximately one-third of major U.S. corporations provide basic skills training for employees, and U.S. industry as a whole spends about $25 billion yearly on remedial education. **Businesses spend as much on remedial math education for employees as is spent on math in schools and colleges** (88).

A study on the feasibility and appropriateness of lengthening the public school term conducted for **the state of Virginia (72) concluded that a decision to extend the length of the school year should be delayed** until:

1) the Common Core of Learning outcomes are further delineated and time requirements for instruction and student mastery are identified,

2) data from pilot schools that are implementing models for increasing instructional time are evaluated, and

3) sufficient funds to cover the additional costs for implementation can be identified at state and local levels.

The study further concluded the following:

> Within the resources available, **the state should support localities that wish to implement and evaluate models for extending instructional time, including a longer school year.** School divisions should be responsive to the attitudes and values of the individual community and tailor instructional schedules accordingly.

Expenditure per pupil, in constant 1988-89 dollars, increased 77 percent, from $2,618 in 1969-70 to $4,639 in 1988-89.
In constant 1989-90 dollars (adjusted for inflation), current expenditures for public elementary and secondary schools increased from $115 billion in 1969-70 to $181 billion in 1989-90 (73).

The number of children with disabilities served in schools grew by 26 percent between 1976-77 and 1989-90 while total elementary and secondary enrollment has declined (73).

Nationally, **there were five fewer students per teacher in 1989 than 1969** (73).

In constant 1989-90 dollars, **the average teacher salary has increased slightly from $28,995 in 1969-70 to $31,331 in 1989-90** (73).

Total public expenditures for education amounted to $312 billion in 1989-90, up 9 percent from the previous year (74).

In 1989-90, 5.9 percent of revenues for elementary and secondary school education were contributed by the federal government; 47.5 percent from state governments; and 46.6 percent from local governments (74).

While national expenditures on instruction average about 61 percent, great differences are found in spending on schools within the same school district. The diversity in spending is far greater within school districts than across them, meaning that the averages reported in most surveys are obscuring great differences in how money is spent on schools (75).

School districts vary in the percentage of money they allocate to central office versus schools. In his study of 8 school districts, Cooper found **the percent of funds used for central office ranged from 20.4 percent to 5.9 percent** (76). Similar ranges are found in other schools (75).

School districts consistently spent more per pupil for secondary than for elementary students (76).

Large regional variations exist in the relative share of education costs assumed by the state versus local communities. For example, in the New England region, over two thirds of the districts total revenue was generated locally from such sources as local taxes and tuition payments from other districts. In the far western states, a little over one third of the districts' total revenue was supplied locally (77).

The cost savings in multi-tracked year-round programs depends in part on how many additional students are served. With a 15-20 percent increase in the number of students served in a building, the costs per student begin to go down (65).

There are no cost savings in single-track YRE programs (65).

A study of 900 school districts in Texas found that **administrative expenditures per pupil above about $300 (in 1986 dollars) do not seem to have much effect on student achievement.** This finding lends support to the argument that some public schools may be spending too much money on administration and not enough on classroom inputs (78).

In 1990, system-wide school district testing averaged about 7 hours per year for an average student (half in direct testing and half in related activity). Wide variations were found in the amount of time for testing with some students spending as many as 30 hours a year. **The average cost per student was $15 dollars including the cost of the test and staff time. The typical test was a multiple choice exam. Less common performance-based tests cost about $20 per student.** A national test modeled on the common multiple choice tests, if taken by 10 million students a year, would cost about $160 million; a national performance-based test similar to those now developed in several states would cost $330 million per year, or almost two thirds of the $516 currently estimated to be spent on system-wide testing (80).

School staff are often unaware of services available through juvenile justice, social service, or mental health agencies. As a result, schools add on functions (e.g. aids and drug education) rather than collaborate with other agencies that could provide the services (79).

RESEARCH-BASED OBSERVATIONS

The U.S. is not alone in its concern about the rising unit costs of education. More students now complete secondary and post-secondary education, and the costs rise disproportionally with educational level. **In a typical OECD country, it costs perhaps three times as much to educate a 17-year-old as it takes to educate a 6-year-old.** (81).

Making the educational system more effective in the long run will require a significant investment of resources up front (81).

CHANGES IN LAWS AND REGULATIONS

THE CHARGE:

To conduct an analysis and make recommendations concerning changes in laws and regulations as may be required to facilitate States, school districts, schools, and parents in adopting longer academic days and years.

RESEARCH FINDINGS:

Note: The Council of Chief State School Officers is conducting a survey of state level activities. The information will be available in the next 6-8 weeks. In addition, Nelson Ashline, who was recently detailed to the Commission, is collecting information related to this part of the legislation.

General Findings:

The typical high school student tends to learn considerably more, comparable to a extra year's worth of study, when he or she attends a high school that is effectively organized rather than one that is not. Effective schools have strong leadership, clear and ambitious goals, strong academic programs, teacher professionalism, shared influence and staff harmony (85).

A study of 500 American high schools found that the freer schools are from external control - the more autonomous, the less bureaucratic constraint - the more likely they are to have effective organizations. The researchers conclude that the most important prerequisite for the emergence of effective school characteristics is school autonomy (85).

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