

Synthesis of Research on Homework

Grade level has a dramatic influence on homework's effectiveness.

In the 1950 edition of the *Encyclopedia of Educational Research*, H.J. Otto wrote, "compulsory homework does not result in sufficiently improved academic accomplishments to justify retention" (Otto 1950, p. 380). Eighteen years later, P.R. Wildman went a step further, stating that "whenever homework crowds out social experience, outdoor recreation, and creative activities, and whenever it usurps time devoted to sleep, it is not meeting the basic needs of children and adolescents" (Wildman 1968, p. 203).

Today, it is hard to fathom how these educators could have arrived at such negative appraisals of homework. We must realize, however, that our present attitude is a third renaissance in the belief that homework has pedagogical value. When the 20th century began, the mind was viewed as a muscle that could benefit from men-

tal exercise, or memorization. Since memorization could be done at home, homework was viewed as good. During the 1940s, the emphasis in education shifted from drill to

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problem solving. Thus, as Otto's remark exemplifies, homework fell out of favor. The launch of Sputnik by the Russians in the 1950s reversed this trend. The public worried that education lacked rigor and left children unprepared for complex technologies. Homework, it was believed, could accelerate knowledge acquisition. The 1960s witnessed yet another reversal, with homework viewed as a symptom of needless pressure on students. Wildman expressed the concern of the time that too much emphasis on school would lead to the neglect of other areas of personal fulfillment. In the 1980s, homework has again come to the fore. A primary stimulus behind its reemergence was the report *A Nation at Risk* (NCEE 1983).

Given the swings in public attitude, can research tell us if homework serves a useful purpose? Not surpris-

ingly, reviews of homework research give appraisals that generally fit the tenor of their times. Through selective attention and imprecise weighting of the evidence, research can be used to muster a case to back up any position. Past reviews of the homework research certainly display this characteristic.

A New Attempt

In 1986, I received a grant from the National Science Foundation to try again to gather, summarize, and integrate the research on the effects of homework. I began the project with no strong predisposition about whether homework was good or bad, but with a son in kindergarten and a daughter in preschool the issue was certainly growing in importance to me. The project

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lasted two years and resulted in my writing the first full-length book on the subject (Cooper 1989a). The review covered nearly 120 studies of homework's effects.

I attempted to uncover all of the past evidence, both positive and negative in result. The search led me through computer databases, the reference lists of over a dozen previous reviews, and correspondence with researchers, deans of education schools, state education agencies, and school districts. I then applied the most advanced statistical techniques for synthesizing research (Cooper 1989b) to estimate homework's effects and discover other factors in the school and home environment that might influence its impact.

What Might Homework Do?

My task had to begin with a clear definition of homework and a complete cataloging of its potential positive and negative effects. I defined homework as "tasks assigned to students by school teachers that are meant to be carried out during non-school hours" (Cooper 1989a, p.7). This definition excludes (a) in-school guided study, (b) home study courses, and (c) extracurricular activities. It does include assignments given by first-period teachers that students complete while ignoring a second-period lecture!

The array of potential positive and negative effects of homework I found in the literature is broad and often surprising. These are listed in Figure 1. Among the suggested positive effects of homework, the most obvious is that it will have an immediate impact on the retention and understanding of the material it covers. More indirectly, homework will improve students' study skills, improve their attitudes toward school, and teach them that learning can take place anywhere, not just in school buildings between 9 a.m. and 3 p.m. There are many potential nonacademic benefits as well, most of which relate to fostering independent and responsible character traits. Finally, homework can involve parents in the school process, enhancing their appreciation of education and allowing them to express positive attitudes toward their children's achievement.

The suggested negative effects of homework make more interesting

Fig. 1. Suggested Effects of Homework

Positive Effects

- Immediate achievement and learning
 - Better retention of factual knowledge
 - Increased understanding
 - Better critical thinking, concept formation, information processing
 - Curriculum enrichment
- Long-term academic effects
 - Willingness to learn during leisure time
 - Improved attitude toward school
 - Better study habits and skills
- Nonacademic effects
 - Greater self-direction
 - Greater self-discipline
 - Better time organization
 - More inquisitiveness
 - More independent problem solving
- Greater parental appreciation of and involvement in schooling

Negative Effects

- Satiation
 - Loss of interest in academic material
 - Physical and emotional fatigue
- Denial of access to leisure-time and community activities
- Parental interference
 - Pressure to complete assignments and perform well
 - Confusion of instructional techniques
- Cheating
 - Copying from other students
 - Help beyond tutoring
- Increased differences between high and low achievers

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Fig. 2. A Model of Factors Influencing the Effect of Homework

<i>Exogenous Factors</i>	<i>Assignment Characteristics</i>	<i>Initial Classroom Factors</i>	<i>Home-Community Factors</i>	<i>Classroom Follow-up</i>	<i>Outcomes or Effects</i>
Student characteristics Ability Motivation Study habits Subject matter Grade level	Amount Purpose Skill area utilized Degree of individualization Degree of student choice Completion deadlines Social context	Provision of materials Facilitators Suggested approaches Links to curriculum Other rationales	Competitors for student time Home environment Space Light Quiet Materials Others' involvement Parents Siblings Other students	Feedback Written comments Grading Incentives Testing of related content Use in class discussion	Assignment completion Assignment performance Positive effects Immediate academic Long-term academic Nonacademic Parental Negative effects Satiation Denial of leisure time Parental interference Cheating Increased student differences

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reading, given the present atmosphere. First, some educators worried that homework could lead to satiation effects. They suggested that any activity can remain rewarding for only so long. Thus, if students are required to spend too much time on academic material, they are bound to grow bored with it. Second, homework denies access to leisure time and community activities. Can't children learn important lessons, both academic and nonacademic, from soccer and the scouts? Third, parental involvement can often turn into parental interference. Moms and dads can confuse children if the instructional techniques they use differ from those used by teachers. Fourth, homework can actually lead to the acquisition of undesirable character traits by promoting cheating, either through the direct copying of assignments or by help with homework that goes beyond tutoring. Finally, homework could accentuate existing social inequities. Children from poorer homes will have more difficulty completing assign-

ments than their middle-class counterparts. Poorer children are more likely to work after school or may not have a quiet, well-lit place to do their assignments. Homework, it was argued, is not the great equalizer.

What Might Influence Homework's Effect?

My literature survey led me to conclude that homework probably involves the complex interaction of more influences than any other instructional device. Because homework goes home, we have to consider variations in out-of-school environments when we think about what might determine the value of an assignment. For other forms of instruction, only the teacher and the classroom need be considered. Further, individual differences among students play a large role because homework occurs in situations that give students more discretion concerning when and how (and, indeed, whether) to complete an assignment.

To organize the influences on homework, I developed a process

model of the factors affecting the utility of homework. Temporally organized, the model is depicted in Figure 2.

The process begins by acknowledging that student characteristics, the subject matter, and especially the grade level will influence homework's value. Next, the characteristics of the assignment will play a role. Homework assignments can be short or long, they can have different purposes (for example, the practice of old material, introduction of new material, integration of skills, or extension of the curriculum), they can be tailored for individual students or entire classes, and they can be meant to be completed by individuals or as group projects. Teachers can also take varying amounts of time and effort setting up an assignment.

When the assignment goes home, several factors will affect how it is carried out, including the student's other time commitments, the home environment, and the involvement of others. Finally, how the teacher treats

assignments when they are returned may affect homework's utility. Some teachers may simply collect assignments, while others go over them in class and provide written feedback, evaluative comments, or grades.

Does Homework Work?

Having defined homework, catalogued its potential effects, and developed a process model to guide my search, I next had to organize and integrate the research literature that addressed the utility of homework. I found three sets of studies that could help answer the general question of whether homework improves students' achievement.

In the first set of studies, researchers simply compared the achievement of students given homework assignments with students given no homework nor any other treatment to compensate for their lack of home study. I found 20 studies conducted since 1962. Of these, 14 produced effects favoring homework while 6 favored no homework.

Most interesting, however, was the dramatic influence of grade level on homework's effectiveness. Let's assume a hypothetical teacher teaches two classes of 25 students and, through some remarkable accident of nature, each student in one class has an exact counterpart in the other. As-

Within reason, the more homework high school students do, the better their achievement.

sume further that the teacher uses the exact 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 percent 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 teaches in junior high school, the average homeworker would rank 10th in the no-

homework class. In elementary school, however, homework would not help the student surpass *any* schoolmates.

The next set of evidence compared homework to in-class supervised study. In these investigations, students not receiving homework were required to do something else to compensate. Most often students did homework-like assignments after school or instead of other activities during school.

These studies were not as favorable toward homework as the first set. Overall, the positive effect of homework was about half what it was when it was compared to no treatment. This should not surprise us. There is no reason to believe homework would be more effective than in-class study. In fact, alternative treatments should be devisable that are far superior to homework. The question is one of how best to use children's time and school resources. Most important in these studies was the emergence once again of a strong grade-level effect. When homework and in-class study were compared in elementary schools, in-class study actually proved superior. In junior high, homework was superior, and in high school the superiority of homework was most impressive.

Finally, a third set of studies did not involve the actual manipulation of homework treatments. Instead, I found 50 studies that correlated the amount of time students reported spending on homework with their achievement levels. Many of these correlations came from statewide surveys or national assessments. Of course, correlation does not mean causation; it is just as likely that high achievement causes students to do more homework as vice versa. So we must be careful not to overinterpret these results. In all, 43 correlations indicated that students who did more homework had better achievement scores while only 7 indicated the opposite. Again, a strong grade-level interaction appeared. For students in grades 3 through 5, the correlation between amount of homework and achieve-

Highlights of Research

Homework has a positive effect on achievement, but the effect varies dramatically with grade level. For high school students, homework has substantial positive effects. Junior high school students also benefit from homework, but only about half as much. For elementary school students, the effect of homework on achievement is negligible.

The optimum amount of homework also varies with grade level. For elementary students, no amount of homework—large or small—affects achievement. For junior high school students, achievement continues to improve with more homework until assignments last between one and two hours a night. For high school students, the more homework, the better achievement—within reason, of course.

I found no clear pattern indicating that homework is more effective in some subjects than in others. I did conclude, however, that homework probably works best when the material is not too complex or completely unfamiliar. Studies comparing alternative feedback strategies revealed no clearly superior approach.

—Harris Cooper

ment was nearly zero; for students in grades 5 through 9 it was $r = +.07$; and for high school students it was $r = +.25$.

The evidence is clear. Homework has substantial positive effects on the achievement of high school students. Junior high students also benefit from homework but only about half as much. For elementary school students the effect of homework on achievement is trivial, if it exists at all.

Are Some Homework Assignments More Useful Than Others?

In addition to looking at homework's overall effectiveness, researchers have also examined how variations in assignments might influence their utility. One obvious question is whether homework is more effective for some subjects than for others. Based on the three sets of evidence just described, I found no clear pattern indicating an influence for subject matter. I did conclude, however, that homework probably works best when the material is not complex or terribly novel.

Another important question concerns the optimum amount of homework. Nine studies correlating the amount of time students spent on homework with achievement allowed me to chart performance levels as a function of time. As might be expected, the line-of-progress was flat in young children—since homework generally did not improve elementary students' performance, it really did not matter how much was assigned. For junior high school students, I found that achievement continued to improve with more homework until assignments lasted between one and two hours a night. More homework than this resulted in no more improvement in achievement. For high school students, on the other hand, the line-of-progress continued to go up through the highest point on the measured scales. While common sense dictates there is a point of diminishing returns, it appears that, within reason, the more homework high school students do, the better their achievement.

It is better to distribute material across several assignments than to have homework concentrate only on material covered in class that day.

I will only briefly mention several other findings on variations in homework assignments. There was strong evidence that it is better to distribute material across several assignments rather than have homework concentrate only on material covered in class that day. Both practice and preparation are beneficial. The few (poorly designed) studies examining parent involvement in homework suggested that giving parents a formal role in homework had neither a positive nor negative effect on its utility. The same was true for individualizing homework assignments. Given the added burden individualization creates for teachers, its benefits were minimal. Finally, I found no study that compared a feedback strategy for homework (i.e., grading, instructional or evaluative comments) with a no-feedback strategy. Several studies did compare alternative feedback strategies; these revealed no clearly superior approach.

Gaps in the Literature

While my review of the literature revealed some clear and dramatic find-

ings, the cumulative research was also somewhat disappointing. First, many of the studies used poor research designs. The homework question would benefit greatly from some well-conducted, large-scale studies. Second, given the richness of thinking and debate on homework, exemplified by the list of its suggested positive and negative effects and the process model, research has been narrowly focused on achievement as an outcome. Only a few studies looked at homework's effect on attitudes toward school and subject matter (with generally negligible results). No studies looked at non-academic outcomes like study habits, cheating, or participation in community activities. Any data on these potential outcomes of homework—really the outcomes that make homework unique—would be better than the evidence we have now.

A Generic Policy Guideline

In the course of my review of homework, I read over 100 research reports and 100 conceptual articles and policy statements. As I read many policy statements, I found that some recommendations made great sense but others contradicted the best evidence. Therefore, the last task I set myself was to write a homework policy for Generic School District USA, based on the research evidence and other bits of wisdom I uncovered in my trek through the literature.

My first recommendation is that coordinated policies should exist at the district, school, and classroom levels. Some of the issues that need to be addressed at each level are unique to that level, while others overlap.

Districts heed to state clearly the broad rationale why homework is given, why it is sometimes mandatory, and what the general time requirements ought to be. Schools need to further specify time requirements, coordinate assignments between classes, and set out the role of teachers and principals. Teachers need to adopt classroom policies that outline what is expected of students and why.

My suggested policy is summarized in Figure 3. I will not go over it point by point, but a few underlying philosophical considerations ought to be made explicit. First, I recommend that elementary school students be given

homework, even though it should not be expected to improve test scores. Instead, homework for young children should help them develop good study habits, foster positive attitudes toward school, and communicate to students

the idea that learning takes place at home as well as at school. As such, homework assignments in elementary grades should be short, should employ materials commonly found in the home environment, and should lead to success experiences.

In junior high school the academic function of homework should emerge. However, its role in developing motivation should not be overlooked. Therefore, I suggest a mix of both mandatory and voluntary homework. Voluntary homework should involve tasks that are intrinsically interesting to students of this age.

Homework should never be given as punishment. Implicit in such a function is the communication that schoolwork is boring and aversive.

In high school, the teacher can view the home as an extension of the classroom. Practice and review of lessons already taught and simple introductions to material about to be covered should be common assignments. So should assignments that require students to integrate skills or different parts of the curriculum.

Regardless of grade level, I recommend that the formal role of parents in homework be kept to a minimum. Parents differ in interest, knowledge, teaching skills, and time available. Obviously, in earlier grades parents should be more involved. Their role should permit them to express how much they value school achievement. In addition to helping their children practice reading, spelling, and math skills, parents can do this by drawing up contracts with their children about study times, establishing rewards for completed assignments, or simply by signing homework before it is returned to school.

I also recommend that individualization of assignments within classes not be a high priority. Most classes are made up of students who are relatively homogeneous in ability. Developing individualized homework can create a time burden for teachers with little payoff. Teachers who teach multiple sections progressing at different rates might consider giving students at the high end of the slower section and the

Fig. 3. A Recommended Homework Policy

For Districts

Homework is a cost-effective instructional technique. It can have positive effects on achievement and character development and can serve as a vital link between the school and family.

Homework should have different purposes at different grades. For younger students, it should foster positive attitudes, habits, and character traits. For older students, it should facilitate knowledge acquisition in specific topics.

Homework should be required at all grade levels, but a mixture of mandatory and voluntary homework is most beneficial.

The frequency and duration of mandatory assignments should be:

1. Grades 1 to 3—one to three assignments a week, each lasting no more than 15 minutes
2. Grades 4 to 6—two to four assignments a week, each lasting 15 to 45 minutes
3. Grades 7 to 9—three to five assignments a week, each lasting 45 to 75 minutes
4. Grades 10 to 12—four to five assignments a week, each lasting 75 to 120 minutes

For Schools

The frequency and duration of homework assignments should be further specified to reflect local school and community circumstances.

In schools where different subjects are taught by different teachers, teachers should know:

1. What days of the week are available to them for assignments
2. How much daily homework time should be spent on their subject

Administrators should:

1. Communicate the district and school homework policies to parents
2. Monitor the implementation of the policy
3. Coordinate the scheduling of homework among different subjects, if needed

Teachers should state clearly:

1. How the assignment is related to the topic under study
2. The purpose of the assignment
3. How the assignment might best be carried out
4. What the student needs to do to demonstrate that the assignment has been completed

For Teachers

All students in a class will be responsible for the same assignments, with only rare exceptions.

Homework will include mandatory assignments. Failure to turn in mandatory assignments will necessitate remedial activities.

Homework will also include voluntary assignments meant to meet the needs of individual students or groups of students.

All homework assignments will *not* be formally evaluated. They will be used to locate problems in student progress and to individualize instruction.

Topics will appear in assignments before and after they are covered in class, not just on the day they are discussed.

Homework will not be used to teach complex skills. It will generally focus on simple skills and material or on the integration of skills already possessed by the student.

Parents will rarely be asked to play a formal instructional role in homework. Instead, they should be asked to create a home environment that facilitates student self-study.

low end of the higher section assignments meant for the other class.

Finally, grading should be kept to a minimum. Homework should not be viewed as an opportunity to test. Homework assignments should be successfully completed by nearly all students, meaning teachers should not discriminate much among different performance levels. Having students do homework out of fear of negative consequences turns a situation ideal for building intrinsic motivation ("I must enjoy this; I'm doing it and the teacher isn't standing over me") into one that implies the teacher thinks external contingencies are required to get it done. Teachers should collect homework, check it for completeness, and give intermittent instructional feedback. This procedure demonstrates homework is taken seriously and has a purpose. The purpose should be to diagnose individual learning problems.

To conclude, my review of the literature indicated that homework is a cost-effective instructional device. However, it must serve different purposes at different grades. Our expectations for its effects, especially in the short term and in earlier grades, must be modest. It should be one of several approaches we use, along with soccer and the scouts, to show our children that learning takes place everywhere. □

Author's note: If you would like to correspond with me concerning homework, I can be reached at the Center for Research in Social Behavior, 111 E. Stewart Rd., University of Missouri, Columbia, MO 65211; (314) 882-7888. Copies of *Homework* can be obtained by writing Longman Publications, Inc., 95 Church St., White Plains, NY 10601, or by phoning 1-800-447-2226. A complete list of references used in my review can be found in the book.

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