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ABSTRACT

A survey of the parents at a middle school in central Florida indicated that parents believed homework should contribute to the student's grade and that 47% of the respondents felt that mathematics should have daily homework. Based on these results, a study was conducted to determine the effects of implementing an innovative automated communication program that contacted parents every day by telephone to communicate homework results for their children. Twenty-one sixth-grade students failing mathematics and their parents from one team within the middle school were selected to participate in the study. The original 21 students selected were reduced by three students through attrition. Two students moved and one was placed on a different academic team. The progress of the remaining 18 students was monitored through meetings with the mathematics teacher. The program was based on a daily routine that had students record their assignment on a Parent Homework Record, required parents to initial the form upon completion of the assignment, initiated daily contact with the parents via an automated telephone system to inform parents of assignment completion and new assignments, required parents to initial the form to verify receiving the recorded phone message, and had the teachers initial the form of credit for the completed homework. The program was implemented for 10 weeks. Results indicated that the group mean for homework completion improved from 24% to 80%, that student achievement improved on teacher-made tests. As a result of the study, the program will be implemented in the other two sixth-grade teams at the middle school and presented to the school board for possible utilization school-wide. (Contains 17 references.) (MDH)

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IMPROVING STUDENT GRADES IN MIDDLE SCHOOL MATHEMATICS
THROUGH A HOMEWORK POLICY INVOLVING AUTOMATED DAILY
PARENT CONTACT

by

Brad Garner

A Practicum Report

Submitted to the Faculty of the Center for the Advancement
of Education at Nova University in Partial fulfillment of
the requirements for the degree of Master of Science.

The abstract of this report may be placed in a National
Database System for reference.

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Authorship Statement

I hereby testify that this paper and the work it reports are entirely my own. Where it has been necessary to draw from the work of others, published or unpublished, I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of other workers in the field and in the hope that my work, presented here, will earn similar respect.

Signed Brad Garner

Abstract

Improving Student Grades in Mathematics Through a Homework Policy Involving Automated Daily Parent Contact.

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Descriptors: Homework/Mathematics/Secondary Education/
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The high failing rate among middle school sixth grade mathematics students was attributed to lack of homework completion. A review of the literature cited lack of parent involvement and communication as a major factor in homework failures. The goal of the practicum was to increase the rate of homework completion in the target group. The main strategy used an automated dialing system to inform parents of homework and provide feedback regarding completion of assignments. Homework completion increased dramatically during the period of implementation, and, consistent with "time on task" research (Walberg, 1985), student test scores rose as well.

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CHAPTER I

PURPOSE

Background

The author of this practicum had been the administrative dean and sixth grade administrator at Super Middle School for two years. Other related experience included four years as a teacher of English and social studies at the junior high level, and two years as administrative dean at another middle school within the district. In addition to primary duties covering school-wide attendance and discipline, the writer's duties included responsibility for all programs that take place in the sixth grade at Super Middle School.

This practicum was conducted in a public middle school located in metropolitan Central Florida. The school community is predominantly urban and suburban and has substantial economic interest in the tourist, motion picture, and service industries. The socioeconomic background of the school covers the

entire range of lower to upper-middle class. Fifty-five percent of the students were white, 24 percent were Black, 15 percent were Hispanic, six percent were Asian, and less than one percent were American Indian. Over 75 percent of the 1,551 students attending Super Middle School rode the bus to school.

The sixth grade consisted of 522 students divided into three academic teams. Each academic team was a school within the school, sharing the same five teachers for reading, mathematics, language arts, social studies, and science. The teachers met daily to discuss student concerns, discipline, and team policy.

The target group for the practicum was selected from the mathematics classes on Academic Team H. The Team H mathematics instructor was in his first year of teaching and had a degree in accounting. He assisted the author in selecting subjects, compiling data, and implementing the practicum.

Identification of the Problem

Teachers and parents agreed that there was a problem with homework at Super Middle School. The

subject has been explored in interviews with teachers and written surveys of parents regarding their attitudes toward homework.

Homework determined up to 30 percent of a child's total grade in mathematics classes at Super Middle School. This is a reflection of the perceived importance of homework in acquiring and maintaining mathematics skills. In addition to the weight of homework itself in calculating the final grade, all the mathematics teachers in the sixth grade agreed that high scores on quizzes and tests can be attributed to the completion of homework on a regular basis. Students completing all or most of the homework assigned had substantially higher grades. Conversely, students completing little or no homework are more likely to receive D's and F's in mathematics. In fact, all those students receiving F's in mathematics did few to none of their homework assignments or had severe attendance problems. These teachers believe that the failure rate would be significantly reduced if more students did their homework.

In the Annual Middle School Survey administered to parents during the 1989-90 school year at Super Middle School, homework ranked nineteenth of 20 items, indicating a low level of satisfaction with homework at Super Middle School. This dissatisfaction was further probed in a homework-specific survey (Appendix A) administered to parents of sixth graders in December of 1990. The sample included a total of 151 returned surveys from all three academic teams.

Regarding the weight that homework should have in determining a student's final grade, 60 percent of the parents surveyed believed that homework should account for 20 to 40 percent. Thirty percent felt that 50 percent or more of their child's grade should be based on homework. Only 10 percent wanted homework to count 15 percent or less of the final grade.

When asked about the rationale for assigning homework, most of the parents agree that practice and application is foremost. Super Middle School mathematics teachers estimated that 90 percent of the homework assigned is for the purpose of practicing

learned skills. Forty-six percent of the parents felt that practicing skills that are already learned is the most important reason for assigning homework. Twenty-nine percent believed applying learned concepts outside the school setting was most important. Fifteen percent wanted homework to accomplish tasks that would take up too much time if done in class. Only 11 percent held the idea that homework should be used to learn new concepts under the direction of parents.

Mathematics was the subject chosen by 47 percent of the parents to have daily homework. Reading and science were chosen by 16 percent and 14 percent respectively regarding the need for daily homework, while 10 percent of the surveyed parents felt that all academic subjects should have some homework every day. When asked which subject should never have assigned homework, 58 percent believed that none of the five academic subjects should be without some homework. Twenty-one percent felt that reading should have no homework assigned. Language arts, science, and mathematics were chosen by nine, seven, and four

percent respectively to have no assigned work outside of school.

Parents were given five choices for the statement which best describes the problem with homework at Super Middle School. Thirty-one percent felt that parents are unsure whether their children have homework. Twenty-three percent attributed the problem to their child's lack of understanding in following homework directions. The belief that too little homework is assigned was held by 22 percent of the parents surveyed, while only 13 percent believed that their child receives too much homework.

Based on the results of the parent survey and the rationale of the teachers questioned, it was necessary to implement a structured program of homework in sixth grade mathematics classes at Super Middle School. The program needed to include a policy of meaningful and frequent homework assignments. A system of regular communication with parents regarding specific assignments and continued feedback needed to accompany this program.

Outcome Objectives

A review of teacher gradebooks in the sixth grade reveals that 15 percent of the sixth grade was failing mathematics. The mathematics teachers attributed nearly all of the failures to student shortcomings in completing homework. Twenty-one sixth grade students from Team H had been identified for the target group by the author and their mathematics teacher. These students were failing mathematics due to low test scores and incomplete homework assignments. For 10 weeks, students in the target group participated in a program to increase their rate of homework completion in order to attain the following objectives:

1. During the ten weeks of implementation, all students will complete at least 65 percent of the assigned homework as evidenced by the teacher's gradebook. Sixty-five percent is the minimum percentage required to receive a passing grade according to district policy.

2. All students will improve their level of classroom participation as a result of completing

homework assignments. This will be measured by teacher observation and anecdotal record.

3. All students will write down their daily homework assignments and keep track of completion on their weekly parent homework records (Appendix B). This will be evidenced by collecting the previous week's records each Monday throughout the implementation.

4. All students will improve their scores on teacher-made mathematics tests during the ten-week implementation period.

5. Fifty percent of the students will achieve a sixty-five percent or above average on teacher-made mathematics tests during the ten-week implementation period.

CHAPTER II
RESEARCH AND SOLUTION STRATEGY

Research

When subjected to a review of the literature, the topic of homework proves to be most controversial. Opponents of homework refute research that cites homework as a means of improving student achievement. Barber (1986) claims that efforts toward educational reform involving homework will fail to motivate the apathetic learner, who should be of primary focus, and continue to alienate the uninvolved. He instead advocates the pursuit of activities in school that give students the opportunity to "...think, reflect, and pursue serious inquiry into problems and issues that are important to them."

Otto (1985) points out that current homework research is opinionated and warns against the "...more must be better approach to improved schooling." He claims that few instances of original research that support homework have any real design on the contributing factors of grade level, race, subject

area, and the specifics of the homework itself.

Homework, like a prescription drug, must be assigned cautiously and according to individual needs.

In contrast, effective schools research recognizes "time on task" as a primary ingredient predicting the amount of learning taking place. American high school students report spending twenty-eight nonproductive hours per week watching television (Walberg, 1985). Much of that time could be spent on task by doing homework.

According to a 1985 report by the North Carolina State Department of Public instruction, sixth grade mathematics students who report doing between five and 10 total hours of homework per week are an average of over two grade levels ahead of students who report that homework is never assigned based upon the results of the California Achievement Tests. These same students are over a grade ahead in mathematics of those who report less than one hour of homework per week, and are four mathematics grade levels above those who say they do not do assigned homework. The same North Carolina

study finds that students who spend between one and three hours per week doing homework score above the national average in reading, language, and mathematics. According to the study, the amount of homework as a variable ranked second only to socio-economic factors.

Surveys of parents, teachers, and administrators find agreement that the perceived ability of homework to develop character, self-discipline, and good study habits outweighs the homework goal of improved academic achievement (Featherstone, 1985). Bents-Hill (1988) found a weak relationship between homework and grades, yet supports student homework assignments as a means of teaching self-discipline, responsibility, independent study habits, and constructive use of leisure time.

Proponents of homework (Walberg, 1986) agree that reform must include many changes within the school day, and qualify their claims of improved student achievement through homework as being directly related to the quality as well as quantity of the assigned work. Jongsma (1985) finds that average and below average students benefit significantly from homework if

certain recommendations are followed.

1. Set homework policies. A logical first step would be to set schoolwide or districtwide policies and communicate them to teachers, students, and parents -- including the consequences for not completing homework assignments.
2. Give clear homework instructions and state the purpose of the assignment. Give no busy work.
3. Get students involved in setting the amount and nature of homework. This may lead to better follow through.
4. Individualize and personalize assignments. Move away from blanket, total class assignments.
5. Demonstrate how to do homework assignments. Don't assume that students have the skills to do the work alone -- especially for projects that involve locating and organizing information.
6. Involve and support the parents who are trying to aid their children. Many districts have telephone "hot lines" where teachers help answer parents' questions about homework.
7. Coordinate homework assignments with other teachers. A frequent complaint when students have more than one teacher is that homework assignments are issued without noting the demands made by other teachers.
8. Grade and evaluate carefully so that the homework assignments will be taken more seriously.

These recommendations are echoed throughout homework research. Dillman (1987) advocates the use of homework contracts and student input. Students should help set their own goals in planning homework programs and receive feedback regarding their assignments. Improved student attitudes and achievement will result from homework that is graded and commented upon (Walberg, 1985).

Rich (1984) concurs that parent involvement is essential in reaching students. She recommends rewarding parents for their children's success and providing the means necessary for parents to teach academic skills at home. Communication and feedback are essential to any program of parent involvement. Vratana (1988) recommends that teachers hold workshops to teach parents how to help their children with homework. Stephens (1984) asserts total parent involvement in the homework program to the degree that parents provide assistance, evaluate results, and even assign grades. This promotes total parent involvement in the schooling process.

Some districts have established homework hotlines for those parents who wish to become involved and assist their children with homework. Surveys have indicated that parents are more receptive to the implementation of homework hotlines when their children are attending secondary schools and the work becomes more difficult (Singh, 1988). If hotlines are used only by students and not by parents, the benefit of such a service may be one-dimensional and bypass the opportunity to further involve parents.

Often, students come from homes in which parents or circumstances are not supportive to the completion of homework. In these cases, it is necessary to provide special help after-hours at the school site to assist students in completing assigned homework. After school programs to complete homework can be used while attempts to involve parents continue.

Parkhurst (1989), in a successful effort to improve students' performance, focused on the development of a homework policy involving teachers, parents, and students. Student academic deficiencies

dropped dramatically, and parent attitudes and involvement increased. Parkhurst attributed as much of the project's success to the survey process by which parents, teachers, and students became involved as to the final written policy itself.

Emphasizing the need for a district homework policy, Turvey (1986) explains that parents and students become frustrated in the absence of policy. Homework cannot be predicted and disrupts planned family activities. Teachers are frequently inconsistent in checking and returning assignments, and in the role homework plays in determining the final grade.

Solution Strategy

Though remaining a much debated topic, sufficient evidence indicates that homework, when coupled with consistent policy and parent involvement, will positively affect student achievement and the relationship between school and home. The district homework policy governing Super Middle School provides general guidelines for schools. These district policy

guidelines are written into the Super Middle School Teacher Handbook.

Homework shall be a purposeful extension of the school day providing the student with opportunities for development of good work habits, educational skills, individual responsibilities, self-direction, and creative expression. The implementation of this policy shall be such that assignments for a given day shall not require an excessive amount of time beyond the normal school day.

Homework should be based on the individual needs of the child, or of the class. Homework shall not be assigned on a mass basis just to give children something to do. In the upper elementary grades, it shall not exceed a total of thirty minutes for each day and should be in the form of reference work, individual drill, reporting, extra library reading, etc. At the junior and senior high levels the average total time for all subjects assigned should not exceed 1½ to 2 hours for each school day.

Sixth grade students at Super Middle School are assigned no more than ninety minutes of homework per day. Teachers coordinate homework during daily team meetings to ensure that district policy regarding time spent on homework is followed. The educational rationale for such assignments is also discussed during these meetings.

Parent involvement is the main ingredient lacking in the formula proposed by Jongsma (1985). A revised homework strategy for Team H would need to target those students who are not completing daily mathematics assignments and those students whose parents are not involved in the homework process. A homework hotline would fail to engage parents not taking the initiative to call or parents who do not realize that their children have homework.

The school attendance office, which is administered by the author, uses a computerized telephone system that generates a daily list of absentees and contacts their homes automatically. The computer records whether the home phone was answered, busy, or out of order, making three attempts over a period of time if not answered. This system has the potential to be used in place of a homework hotline to call homes to give information concerning daily mathematics assignments and provide parents feedback concerning their children's completion of these assignments.

CHAPTER III

METHODOLOGY

Procedures

The author implemented a plan of intense parent communication regarding student mathematics grades, completion of homework, daily assigned homework information, and assistance with assignments. The program featured a computerized automated telephone system, normally used in school-wide attendance procedures to contact parents regarding student absences, to contact parents and deliver feedback regarding mathematics homework. Students were given daily assignment logs to be signed by parents and the teacher.

The first week of the program was used to contact parents and inform them of the procedures for the program. Parent response was extremely positive and all agreed to cooperate and participate in the program. Students conferenced with the author and their mathematics teacher during this time to discuss individual goals and expectations. They were given

their weekly parent homework records (Appendix B) at this time to log their progress.

All phases of the program were in place by the second week and continued through the end of the ten-week period. The program was based on a daily routine as follows:

1. Students wrote down the assignment on the Parent Homework Record during mathematics class and had the teacher initial the record to verify the assignment.

2. Students carried the record home and had their parents initial the form upon completion of the assignment.

3. The automated telephone system contacted parents daily to deliver three pieces of information in a recorded message.

- a. "Your child did/did not complete his/her mathematics homework assignment last evening. This will have a positive/negative influence on the total mathematics grade."

This is the only section of the message that

varied from student to student. Parents received one of two messages based on whether the previous evening's assignment was completed. The mathematics teacher provided the author with a daily report (Appendix C) indicating which students completed the assigned homework.

b. "This evenings homework assignment is..." All students received this message, but the message changed each day to specify the particular assignment.

c. "If you have any questions concerning this message or if you require assistance in helping your child complete this evening's math assignment, please call 000-0000 or 999-9999." This message did not change. The author and the mathematics teacher were available to assist parents and answer questions at the phone numbers given.

4. Parents initialed the Parent Homework Record to verify receiving the recorded phone message.

5. Upon returning to mathematics class the next day, students received teacher initials to verify credit for the completed assignment.

Monitoring

The original 21 students selected by the mathematics teacher and the author were reduced by three students through attrition. Two students moved and one was placed on a different academic team. The author monitored the progress of the remaining 18 students through meetings with the mathematics teacher. Students not completing two consecutive homework assignments were conferenced and parents were personally contacted by telephone during the school day. This became necessary on only 11 occasions, seven of which occurred with a single student.

The weekly parent homework records (Appendix B) were checked daily during the first two weeks of implementation, but most students were forgetting to bring them back to school or losing them through the course of the week. The mathematics teacher and the author met during the third week and decided to make

the forms optional. Several students continued to use the forms throughout the program, but most did not use the forms after they became optional. This was a major diversion from the original implementation plan, but it did not seem to affect the rate of homework completion among the members of the target group.

The third segment of each evening's recorded message provided the phone numbers of the mathematics teacher and the author in case assistance was needed. The mathematics teacher was contacted seven times and the author received only two calls. Four of these nine calls were made by parents who wanted to clarify assignments because pens, pencils, or paper was not available when they were listening to the recorded message. The remaining five calls were from students needing help on the assignments.

Evaluation

From the first day of the program the mathematics teacher and the author noticed an increase in the amount of homework completed by the target group. Only one student was performing below expectation, yet even

that student was doing some homework. One parent wrote a letter to the principal in praise of the program and remarked on the improvement in her child's study habits.

The first test given during the implementation period showed no significant gains in student performance. In fact, six students had lower scores than usual on the first test. Subsequent tests and quizzes, however, showed steadily rising progress among members of the target group.

CHAPTER IV

RESULTS

The teacher gradebook was the primary tool in the evaluation of the practicum. Student homework grades and the corresponding test grades used in calculating the final grades were the measure of success.

Table 1

A comparison of student homework completion before and after implementation of the homework program

Student Number	Avg % Before	Avg % After	% of Improvement
1	25	95	70
2	40	85	45
3	20	80	60
4	30	70	40
5	30	90	60
6	40	80	40
7	30	85	55
8	15	80	65
9	35	90	55
10	25	90	65
11	45	70	25
12	15	85	70
13	0	15	15
14	5	90	85
15	20	95	75
16	10	70	60
17	15	80	65
18	30	85	55

The first objective was for students in the target group to complete 65 percent of the assigned homework. As evidenced by Table 1, all but one student met the first objective. The mean for the target group was 80 percent compared to a 24 percent completion average prior to implementation. Even the student who did not meet the first objective experienced a 15 percent improvement in completion. One student improved homework completion by 85 percent. The average improvement in completion of homework was a significant 56 percent.

The second objective was to improve the students' level of classroom participation. Prior to the implementation period, the mathematics teacher subjectively rated each student's participation level as low, moderate, or high (Table 2). After the implementation period, the teacher examined student participation and subjectively noted whether each student's participation had increased, decreased, or remained the same. Though several students remained at the same level of participation, none of the students

experienced a decrease in their classroom participation during the implementation period.

Table 2
A comparison of student participation levels before and after implementation of the homework program

Student Number	Avg Level Before	Avg Level After
1	Low	Same
2	Low	Increase
3	Low	Same
4	Medium	Same
5	Medium	Increase
6	Low	Increase
7	Low	Same
8	Low	Same
9	Medium	Same
10	Medium	Same
11	Low	Increase
12	Medium	Increase
13	Low	Same
14	Low	Same
15	Medium	Same
16	Low	Same
17	Low	Increase
18	Low	Increase

The third objective was for students to record homework assignments on their weekly parent homework records (Appendix B). During the third week of

implementation, the writer and mathematics teacher decided to drop this feature of the program. The program appears to have been successful without this segment of the program.

Table 3
A comparison of student test/quiz averages before and after implementation of the homework program

Student Number	Avg % Before	Avg % After	% of Improvement
1	52	66	14
2	51	68	17
3	83	97	14
4	86	92	6
5	85	94	9
6	57	85	28
7	57	60	3
8	40	63	23
9	86	82	-4
10	60	87	27
11	52	70	18
12	82	93	11
13	36	41	5
14	42	60	18
15	60	86	26
16	36	57	21
17	29	62	33
18	47	73	26

The fourth and fifth objectives were met simultaneously. The fourth objective was to improve the scores of all students on teacher-made mathematics tests, and the fifth objective was to have 50 percent of the students to achieve a 65 percent or above average on teacher made mathematics tests. Consistent with "time on task" research (Walberg, 1985), all students improved their scores on teacher-made mathematics tests. Table 3 indicates that 67 percent of the target group achieved a 65 percent or above average on teacher-made mathematics tests.

Though not achieving each of its objectives to the letter, the program was clearly a success in addressing the problem of student failures in sixth grade mathematics. Only one of the students in the program is currently earning a grade below passing in mathematics. This program can be credited with the success that these students have found in completing their homework assignments.

CHAPTER V
RECOMMENDATIONS

This program will be implemented in the other two sixth grade academic teams at Super Middle School during the 1991-1992 school year. The concept will be shared with the grade level administrators in seventh and eighth grade to solicit their participation also. A school-wide program could then be coordinated with shared responsibility among the grade level administrators and teachers of other the grade levels for the 1991-1992 school year.

The Super Middle School PTA Board is interested in the program and will consider purchasing additional hardware to modify the other administrative computers in the building. The principal has committed to placing additional computer phone lines in the school communications budget if the PTA agrees to fund the hardware.

The district level senior administrator for data processing/user services has expressed an interest in the homework program. Each middle school in the

district has the same computerized automated telephone system for their attendance offices. Results could be shared with the grade level administrators of other schools at the monthly district-wide meetings. The author could then visit the schools of those who decide to participate and provide inservice to others in the use of the attendance computer for this purpose.

The program has proven to be simple to implement and effective in solving the mathematics homework problem at Super Middle School. The author recommends the use of this or similar systems to implement a homework policy involving automated daily parent contact.

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WESTRIDGE HOMEWORK SURVEY

Approximately how much time does your child spend on homework each evening?

- Thirty minutes or less
- Thirty minutes to one hour
- One hour to one hour and thirty minutes
- One hour and thirty minutes to two hours
- Over two hours

Does your child have a quiet place at home to study? Yes No

What percentage of a child's grade should be based on homework? ___%

What is the most important reason for assigning homework? (Please check one).

- To practice skills that are already learned.
- To accomplish tasks that would take up too much time if done in class.
- To learn new concepts while under the direction of parents.
- To apply learned concepts outside of the school setting.

Which subject area should probably have homework assigned almost daily? (Please check one).

- Math
- Science
- Social Studies
- English
- Reading
- None of the above

Which subject area should almost never have homework assigned? (Please check one).

- Math
- Science
- Social Studies
- English
- Reading
- None of the above

Which statements below best describes the problem with homework at Westridge. (Please check one).

- Parents are unsure whether or not their children have homework.
- Students are unsure of their directions in doing homework.
- Too much homework is assigned
- Too little homework is assigned
- Other (Please describe).

Mighty Warriors' Mathematics Parent Homework Record

NAME _____

DATE	ASSIGNMENT	TEACHER INITIALS TO VERIFY ASSIGNMENT	PARENT INITIALS TO VERIFY COMPLETION	PARENT INITIALS TO VERIFY PHONE CALL	TEACHER INITIALS TO VERIFY CREDIT FOR ASSIGNMENT
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					
	TOTAL NUMBER OF HOME- WORK ASSIGNMENTS →		NUMBER →		%

Mighty Warriors' Mathematics Parent Homework Record

NAME _____

DATE	ASSIGNMENT	TEACHER INITIALS TO VERIFY ASSIGNMENT	PARENT INITIALS TO VERIFY COMPLETION	PARENT INITIALS TO VERIFY PHONE CALL	TEACHER INITIALS TO VERIFY CREDIT FOR ASSIGNMENT
MONDAY					
TUESDAY					
WEDNESDAY					
THURSDAY					
FRIDAY					
	TOTAL NUMBER OF HOME- WORK ASSIGNMENTS →		NUMBER →		%



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