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THE EMPOWERMENT OF GIRLS IN THE CLASSROOM

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The general topic of the research is the empowerment of girls in the classroom. The research focuses on the increase of the motivation of girls and their belief in their ability, the creation of warm and close communication between the girls and the teacher, and the changes in technology in the 21st century – all with the goal of empowering the achievements of girls in the field of mathematics and in essence minimizing the differences between girls and boys in the field. From our experience, girls do not empower themselves in the field of mathematics. Girls allow boys to dominate the lessons, to manage the class discussion, to contribute of their knowledge – and girls remain silent. When afterschool enrichment classes in mathematics are recommended to boys and girls, the number of boys exceeds the number of girls, and in actuality, beyond the recommendations, the girls do not attend these courses. Already in the elementary school, the girls lag behind, and this staying behind causes them to make their choices accordingly and thus they lose an important economic resource. We are certain that it is possible to make a change, and we will begin with our attitude toward the girls in the classroom. We will look at our behaviors as teachers, effective behaviors for the promotion of teaching and learning, and we will apply these behaviors to girls, implementing a corrective preferential reference in our behavior.

Key words: girl empowerment, girl motivation, belief in ability, communication, teacher effective behaviors

Introduction

Rationale

Background on the School. The school was established in 1985 with the establishment of the community of Oranit and was called by the name of the community. The school grew and developed as the community developed,

and it became a regional school with 750 students from Oranit and from the nearby communities of Sha'arei-Tikva and Etz-Efraim. Until 1995, the school was also a middle school. In that year, the middle school was moved to a new, separate building, and the Oranit School was redefined as an elementary school. In 2001, when a school was established in Shaarei-Tikva, the students from Sha'arei-Tikva and Etz-Efraim moved there, and since then only students from the community of Oranit study in this school.

In 2011 the school was defined as a school of the arts. The school constitutes an educational center in the community that consists of about 2000 families and emphasizes greatly the value of partnership and contribution for active citizenship and community involvement.

Today 745 students study in the school in 24 classes. The school staff consists of 75 teachers and council workers. The teaching staff consists of 59 teachers. In his famous poem, "I Believe", the poet Shaul Tchernichovsky wrote: "I will still believe in the person, in his spirit, his strong spirit".

The belief in the person is the foundation stone in our vision. It is what gives us the courage to effect changes in our lives. We in the school must find in us the courage to do and to create and to bring about a change that will give the students the wings to fly.

The Oranit School sees the supreme value to be the promotion of the development of the student-the person, in his scholastic achievements and humane values. The school educates the individual for moral commitment towards his fellows and towards the near and far human environment. The school emphasizes the development of a supportive and sympathetic climate, with openness and sensitivity, with honesty and integrity, with the empowerment of the individual and with the acceptance of those who are different, with the goal to develop a student with clear moral values, self-confidence, and personal and social sensitivity. The school emphasizes values of partnership and reciprocity, develops conditions suitable to learning, and directs to involvement in the community with the goal of educating a student to have values of involvement in the community, to influence, and to contribute, so that he will grow up to be a better citizen.

The school believes that a student who engages in art develops for himself a richer cultural world and new and creative tools of expression that will increase his chances of excellence and fulfillment of his abilities. Our school is a warm and close home, which empowers and gives to the students.

To transform the outlook into reality and to implement it in actuality in the educational daily routine, the school staff undergoes a process of the clarification of the aspirations and educational beliefs and the translation of these beliefs into action.

Professional Background of the Teachers. Orli Noriany has been a homeroom teacher for 24 years. She has an undergraduate degree in mathematical education and a graduate (master's) degree in the administration of education. She is currently studying for the doctoral degree in mathematical education. She has instructed teachers in the past and worked as a mathematics teaching instructor on behalf of the Ministry of Education. She has been a mathematics subject coordinator for many years.

The Motive of the Research. When I was little, I did not like mathematics. To put it gently, the mathematical field was not for me. In the elementary school I was a good student, in mathematics as well as the other subjects. In the middle school and in the high school, everything changed: I did not understand the teachers, I did not understand the material, and I simply failed. The result was that I did not come to the lessons, and a vicious circle was created: I did not understand the lesson since I did not come, so I did not know. The teachers did not care – they did not attempt to talk to me, to explain to me, to cause me to come to the lessons or to learn. Since I wanted to obtain the full high school matriculation certificate, I went during the twelfth grade to private teachers and completed three units of mathematics study with a grade of 60. When I went to college, I encountered amazing teachers. It is because of a mathematics teacher there that I am a teacher of mathematics today. A physics professor caused me to deliberate extensively about the subject in which I would choose to major. I was very interested in the lessons, the material appeared to me to be logical, the teachers were nice, and I experienced successes. The teachers praised my thinking and caused me to want to broaden the areas and fulfill my abilities.

In parallel, looking at this period, I spent it entirely with the boys. I was a 'tomboy'. I played basketball and soccer with the boys, and I spent hours in the garage with my late father – putting together, taking part, getting dirty. I rode motorcycles, I sailed boats, and I worked on cars. I was exceptional, and I am exceptional today. This remains the situation today: the feminine side exists in me and has a clear presence but the male occupations have not been pushed aside but exist in full force. In my free time you will find me at the shooting range and not at the mall, with long manicured nails, a mini skirt, and heels – but hitting the target. You will find me building a tent in the forest, crossing bridges and climbing ladders, volunteering with the Police, and searching for challenges.

Do boys tend more to the sciences? Do girls tend more to the humanities? Is this the expectation of the teachers? Do teachers expect boys to tend

more to the sciences and girls to tend more to the humanities? Is this a self-fulfilling prophecy?

Is the fact that I encountered during my life two larger than life figures what caused me to change direction? Did the fact that I was a 'tomboy' keep me in the field and motivate me to search for ways to bring additional girls to the field?

In a courageous personal examination, I agreed to admit fully that my reference to boys is different from my reference to girls. My reference is different both at home and at school. This research is intended first and foremost to change my personal reference and behavior to boys and girls, both at home and at school. There is no doubt that I must learn to address and empower the girls. It was clear to me that the beginning would be theatrical and not real. I greatly hoped that with time I would succeed in performing the change in me and in assimilating it in my personality.

The General Topic and Importance of the Research. The general topic of the research is the empowerment of the girls in the class. The increase of the girls' motivation, the belief in their ability, the creation of warm and close communication with the teacher, the change in the technology of the 21st century – all with the goal of empowering their achievements in the field of mathematics and in essence of minimizing the differences between boys and girls in the field. From our experience, girls do not empower themselves in the field of mathematics. The girls let the boys take over the lessons, manage the discourse in the classroom, and contribute from their knowledge – and they remain silent. When recommendations for afternoon mathematical enrichment courses are made for boys and girls, the number of boys is greatly larger than the number of girls, and in actuality, beyond the recommendations, the girls do not go to these courses. Already from the elementary school, the girls remain behind, and this remaining behind causes them to make their choices and in essence thus we lose an important economic force.

We are certain that it is possible to make a change: we will begin with our reference to the girls in the class. As teachers, we will look at our behaviors, effective behaviors for the promotion of teaching and learning, and we will apply these behaviors on the girls, undertaking 'affirmative action' in our behavior.

Research Objective. The objective of the research study is to examine whether the difference in our responses as teachers empowers or minimizes behaviors and successes of girls in mathematics. (Indirectly, the objective is

to attempt to minimize the difference between the sexes in mathematical education.)

Review of the Literature: Difference between the Sexes in Education

The brain researcher Professor Dafna Yoel[1] asserts that the brain has no sex. She maintains that there are no differences between boys and girls, except for the differences that derive from our attitude towards them from the moment of birth and even beforehand. Professor Yoel holds that the brain changes according to the stimuli and the activity we perform.

Sex is a biological characteristic, while gender is a characteristic that is not biological and in essence is the meaning of being male or female in a certain culture. She further asserts that in the first year of life there are barely any differences between boys and girls (on the average, girls develop more rapidly but the difference is negligible). In contrast, we see a difference in the reference of the environment to boys and girls. There are differences in the attitude of all the agents of socialization, and these differences are consistent.

Yoel[2] maintains that research studies have discovered that what determines the manner of reference of the adult to the infant is not his true sex but the sex that the adult thinks the infant has (baby X research studies).

Over the years, we see that there is a very clear correlation between the behavior of the environment and the development of the children. However, there is no way to prove that the environment is what causes the phenomenon of the differences between boys and girls.

It is important to note that the differences between boys and girls are not great (not in infancy and not in adulthood). The differences simply appear to us to be great, and boys and girls seem to us to be very different. The reason why the differences between boys and girls appear to us to be great is that we have a bias. When a girl has a characteristic of her gender, then we ascribe the characteristic to it. When she does not have such a characteristic, then we do not ascribe it to the sex. Such a bias not only strengthens the existing stereotypes but also does not allow change to occur in them. We emphasize traits that suit a sex and ignore traits that do not suit a sex.

Another mechanism that strengthens stereotypes is to ascribe a certain behavior to a certain sex. For instance, if a girl is energetic and active, then she is energetic and active like a boy is. Such a statement reinforces the stereotype that boys are active and girls are not. A research that examined the

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[1] R. Rodner, *This Text Will Change Your Mind, and It Is Scientific – A Conversation about Rats, Feminism, and Gender*, The Marker, March 6, 2012.

[2] Ibidem.

activity of fetuses discovered that our perception is influenced by our gender stereotypes.

From a young age, children understand what their sex is. It takes a little longer for them to understand that sex is a constant and does not change. The moment children understand what their gender is and understand what a boy is and what a girl is, then their behavior becomes more stereotypical, and in essence, they adjust themselves to what is expected of them, in what is a self-fulfilling prophecy.

Culture today is far more gender-based than in the past. For instance, while in the past there were bicycles for children, today there are bicycles for boys and bicycles for girls.

It is important to note that girls have more freedom to do what boys do. A 'tomboy' is a term for a girl who likes 'boyish' activities but is not an insult, while 'sissy', referring to a boy who plays 'girlish' games, is an insult, and the 'sissy' is not well received in the environment where he lives.

So how do we build a more equal world? A good idea is not to notice the gender. The notice of the gender conveys the message that the gender is very important. Today almost everything is discerned – toys, articles of clothing, colors – and in what seems to be terrible, even children.

One of the methods for examining whether the reference to gender is appropriate and correct is to change the categories. If the reference seems fine in the new category, then it is possible to continue. If it seems bad, then we have to stop immediately. What seems bad in one category is bad in another category. In general, the time has come to stop using the category of gender. The use of this category is a self-fulfilling prophecy.

Where does gender occur? The gender reference begins at home but continues and occurs primarily in the social frameworks. We all lose from this reference – adults as well (for example, in the reference of society to a woman who is a manager or in the reference of society to a man who is interested in staying home and raising his children).

Is it possible that the gender differences will vanish? What will a world without gender differences look like? In a world without gender differences, all people can develop in whatever area they choose. All people can be good in what suits them, according to their choice. In such a world there is nothing that a girl or boy cannot do just because they are boys or girls.

A marvelous example is the case left-handed people. In the past, left-handed people were considered inferior. They would attempt to use their right hands. Today there are still left-handed people, but there is no meaning to this fact, not cultural and not social. Today the fact that a person is left-handed or right-handed does not have any influence on how the person is accepted.

According to Professor Yoel[3], women and men are fundamentally different in a variety of areas. However, the sex does not differentiate between people: while people are different, the difference does not derive from the sex. The difference is the ability and character.

Can we reach this point also in the topic of gender? Time will tell. The aspiration is 'to be yourself', regardless of sex or gender. Thus, it is important that teachers maintain an identical reference to boys and girls and enable personal authentic development.

Questions and Hypotheses

Questions

• What is behavior that promotes scholastic achievements?

• Does personal communication increase the motivation of the girls and consequently their achievements in mathematics?

• What in my behavior as a teacher may increase the motivation to promote the students' scholastic achievements?

• Does the increase of the motivation for the promotion of scholastic achievements cause a change?

• Does my conduct as a teacher influence the girls' achievements in the field of mathematics? Does my conduct as a teacher influence the boys' achievements in the field of mathematics?

• Do the computerized tasks given by the teacher develop a personal relationship and increase the girls' achievements?

• Does the personal communication that is expressed in activity such as email contact empower the relationship between the girls and the teacher? Does it empower the relationship between the boys and the teacher?

• Is there a relationship between the teacher's behavior, the increase of the girls' motivation, and the increase of their achievements?

• Why am I searching for ways to empower the girls?

• Why especially in the field of mathematics?

• Why am I integrating the field of computers?

• Does my tone of speech when I talk to the girls who are good in mathematics change?

• Do I speak differently to girls who are not good in mathematics?

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[3] R. Rodner, *This Text Will Change Your Mind, and It Is Scientific – A Conversation about Rats, Feminism, and Gender*. The Marker, March 6, 2012.

• Do I speak differently to boys?
• Do I speak differently to boys in general or to boys who are good in mathematics?
• Do I address the boys differently?
• Do I address the boys more? Why?

Hypotheses

The research hypotheses are as follows. There is a relationship between the teacher's behavior in the class and the students' achievements. There is a relationship between the teacher's behavior in the class and the increase of the girls' motivation and the increase of their achievements. There is no doubt that personal communication increases the motivation, which increases the achievements.

Computerized tasks are one of the methods for the creation of communication between the teacher and the students. The integration of the computer is a wonderful way to create communication.

Without a doubt, we speak differently to boys than to girls. If we create corrective preferential treatment, then we will see a change.

Methodology

The research study was conducted in the school. The research objective was to examine our behavior as teachers in the classroom. We wanted to examine effective behaviors that we performance, behaviors that promote teaching and learning. The guiding idea was to prepare a list of behaviors that encourage teaching and learning and that we perform – and to perform them more with the girls and then to examine the change in the girls' achievements. In essence, the idea is to create corrective preference for the girls and to see a change in their motivation and in their achievements.

The Research Planning Table

Elements	Effective Behaviors
Create and maintain caring, close, and supportive	• Is interested in the learners' wellbeing and feeling and creates a personal relationship with each one of them. • Addresses the personal events in the learners' lives and displays affection, caring, and interest.

Elements	Effective Behaviors
relations between the teacher and the learners	• Is aware of the learners' personal needs, conveys understanding and acceptance, and provides support, encouragement, and help. • Addresses all the students, even when they are not present and is concerned to create a relationship with them. • Listens honestly and in a focused manner to the learners' statements and examines whether he understood their verbal and nonverbal messages ("I feel that you … am I right?") **The planning was to create and to maintain a close and supportive relationship between the girls and the teacher.**
Create and maintain caring, sensitive, and supportive relations among the learners themselves	• Protects the learners against obstructing responses such as mockery for 'mistakes', contempt, or harm. • Limits learners who interrupt by repeating in a positive manner the rules ("When somebody has received permission to speak, we listen") **The planning was to create a 'feminine empowerment' group.**
Create the motivation to learn	**The planning was to empower the girls' desire to learn and succeed.**
Mediate to support the construction of knowledge and development of thinking via dialogue	• Gives time to think and to organize the answers. • Asks the learners to explain, reason, illustrate, and justify their statements ("You say that … what are your reasons?" • Re-phrases the learners' statements so that they can listen to themselves and reconsider their statements ("You say that … do you mean that …?") • Keeps a safe discussion space that enables thinking for everybody: limits those who interrupt, protects the learners against obstructing responses such as mockery for 'mistakes', contempt, or harm, encourages the 'silent ones' to participate ("Yosi, what's your opinion? We will be happy to hear it.") **The planning was to maintain corrective preference for the girls during the class discussion.**
Give personal feedback promoting the learning	• Provides specific information for the learners regarding (a) level of task performance and (b) the process of learning, while referring to their previous performances and avoiding comparison to others. • Indicates first the successes and achievements, praises and appreciates them, and emphasizes learning behaviors that led to them, and only then indicates aspects and processes that should be improved ("You already know the main traits of … examine whether you combined them in your first paragraph.") • Helps the learners set clear, realistic, and challenging goals for the continuation of the learning. • Provides specific information and explains to the learners explicit-

Elements	Effective Behaviors
	ly the learning processes that will help them continue and advance ("Your summary will be clearer if you use the table for a summative comparison that we learned previously.") **The planning was to empower the girls and thus all means are valid (see examples of these behaviors in this column).**
Mediate a sense of efficacy and a sense of optimism	• Emphasizes in different ways belief in the ability of all the learners to succeed and integrates in her statements messages that express belief in their ability to effectively use feedback and to continue to advance ("This is truly challenging … I am completely relying on your strengths, you understand excellently what you must do, and I am sure that you will succeed.") • Indicates before the learners about the successes that he identifies in them and links them to learning behaviors that motivated these successes ("You wrote an excellent summary, you presented main ideas clearly, you succeeded in doing this because you did not give in to yourself and you coped … wonderful …") • Encourages and strengthens their belief in themselves and in their ability to improve the manners of their performance, to advance, and to reach achievements. • Empowers the optimistic approach among the learners and strengthens them to be active and top adopt steps to search for positive solutions and ways that will enable them to make the possible into what exists. **The planning was to develop among the girls a feeling of efficacy and a feeling of optimism which would lead to success**
Develop the ability of self-feedback and colleague feedback	• Teaches the learners to analyze the factors of success or lack of success, while emphasizing promoting learning behaviors. • Directs the learners to analyze the process and the way in which the goals were achieved and to examine the quality of its products ("Look at the rubric and examine – in which parts did you reach high achievements, in your opinion?") • Gives the students time and tools to correct mistakes and improve performances. • Integrates elements of peer assessment in the process of feedback and assessment and lets the learners discuss with their peers how to improve the points that need it ("Who can and wants to give to … feedback for improvement? According to our rubric, what are the strong points? What can be improved?") **The planning was to develop among the girls abilities of self-feedback that will lead them to success**

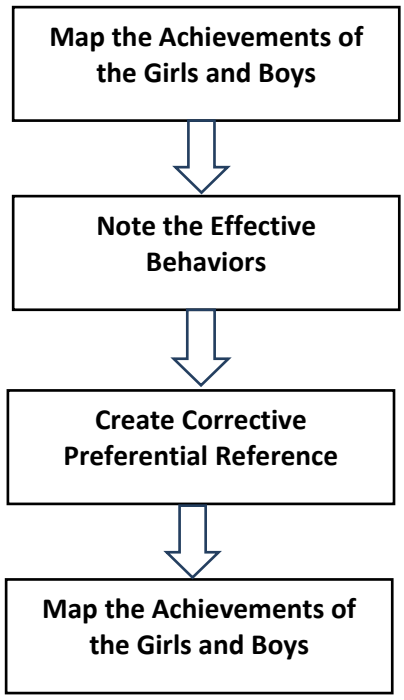

Fig. 1. Research Process

Personal Reflection, before the Start of the Research

Over the years, I have learned and developed. My experience has increased, and so has my professionalism. The ability to stop, to look at what I have done, and to examine it has grown. The ability to attempt to understand the activity and its meaning, the ability to examine how to create a change – this is not a self-evident ability. This ability requires professionalism, maturity, and responsibility. This ability increases my awareness as a teacher of my activity and develops my capacity to work cooperatively and interdependently. This ability promotes me both as a person and as a teacher. This ability teaches me to continue and to research my work – and this is the way I can choose so as to improve my activity and its results and to advance both as a teacher and as a person. This is an effective way, practical and accessible. I only hope that many teachers will follow this path and thus advance themselves and their activity.

Summary of the Findings of the Problem

The problem that constituted the motive of the research process was differences between boys and girls in the mathematical achievements and differences in the students' participation in the class discussion during the lesson.

Examination of the students' achievements indicates the difference between the scores of the boys and girls (see tables number 1-4). Following the self-reporting of the teachers and observations conducted during the lessons, it is apparent that most of the participants in the discussions that are held during the lesson are boys (see tables number 5 and 6).

In an anonymous questionnaire distributed to the students, with the goal of examining possible explanations of the nature of the phenomenon, differences were apparent in the attribution of reasons for participation and non-participation of members of both sexes in the lesson (see table number 7). It was apparent that boys have a sense of efficacy, optimism, belief in ability, and self-confidence, in contrast to the girls, among whom the approach was different, namely, lack of belief in ability, in success, in efficacy, and in essence lack of optimism.

In an interview held with the teachers, it was apparent that this phenomenon indeed exists. There is a difference between the achievements of the girls and the boys and in their cooperation. In the interview with the teachers different reasons were attributed to the participation and non-participation in the lessons.

The Achievements of the Students

The problem that constituted the motive of the research process was the differences between boys and girls in the mathematical achievements and the differences in the participation of the students in the class discussion during the lesson. Examination of the students' achievements indicates a manifest difference between the scores of the boys and the scores of the girls (See tables number 1-4).

Table Number 1

Student	Grade
A	88
B	83
C	79
D	73
E	82
F	80
G	94
H	97
I	91
J	61
K	85
L	74
Mean	82

Table Number 2

Student	Grade
V	90
U	100
T	99
S	80
R	85
Q	90
P	85
O	89
N	93
M	89
L	91
K	100
J	88
I	72
Mean	89

In the first class the average grade of the girls was 82 and the average grade of the boys was 89.

Table Number 3

Student	Grade
A	85
B	84
C	93
D	76
E	89
F	82
G	94
H	87
I	81
J	71
K	95
Mean	85

Table Number 4

Student	Grade
V	89
U	88
T	99
S	89
R	95
Q	90
P	95
O	89
N	95
M	88
L	91
K	100
J	88
I	72
Mean	91

In the first class the average grade of the girls was 85 and the average grade of the boys was 91.

The Participation of the Students

Following the self-reporting of the teachers and observation conducted in the lessons, it was apparent that most of the participants in the discussions that are held during the lesson are boys (See tables number 5 and 6).

First Class
Table Number 5

Lesson	Participation Boys	Participation Girls
1	15	2
2	24	4
3	16	0
4	18	2
5	21	0
6	17	0
Mean	18.5	1

In the first class the mean grade of the participation of the girls is 1 while the participation of the boys is 18.5.

Second Class
Table Number 6

Lesson	Participation Boys	Participation Girls
1	23	0
2	20	3
3	18	4
4	19	2
5	32	6
6	20	0
Mean	22	3

In the second class the mean grade of the participation of the girls is 3 while the participation of the boys is 22.

In both classes greater participation of boys is apparent.

Attribution of Reasons for Success and Failure

In an anonymous questionnaire distributed to the students, with the goal of examining possible reasons for the nature of the phenomenon, differences were apparent in the attribution of the reasons for participation and non-participation of members of both sexes in the lesson. (See the questionnaire in the appendix.) Each one of the students was supposed to address each one of the statements and to give a score from 1 to 5.

Table Number 7

Reason	Score – Boys	Score - Girls
I understand the topics learned in mathematics	4.5	3.2
I succeed in getting good grades in mathematics	4	2.4
I have not mastered the topics learned in mathematics	1.7	3.9
I am missing prior knowledge in mathematics.	1.4	4.2
I do not understand the topics studied in mathematics.	1	3.8
I like studying mathematics.	4.9	2.5
I do not like studying mathematics.	0.4	3.9
I quickly understand new topics of study in mathematics.	4.8	2.2
I need additional study to understand new topics of study in mathematics.	2.1	4.3
It is not easy for me to understand and learn new topics of study in mathematics.	1.3	4.2

In the table, the score presented is the average score of the responses according to gender. It is apparent that the boys had a sense of efficacy, optimism, belief in ability, and self-confidence, in contrast to the girls. Namely, the girls had a lack of belief in ability, in success, in efficacy, and in essence lack of optimism. In an interview with the teachers, different reasons were attributed to the students' participation and non-participation in the lessons.

Statements of the Teacher

In the interview with the first teacher, it was apparent from her rich experience that boys like the subject more, boys participate more in the lessons, and boys succeed more in the tests. The boys believe in their ability. If they don't succeed, they do not give up, while the girls do not participate, do not dare, and are ashamed to try and not succeed. In terms of achievements, there is also a gap.

In an interview with the second teacher, it was apparent that boys succeed more in tests than do girls. She also states that most of the participants in the lessons are boys. If she tries to let the girls speak, they do not always take the opportunity or during the question the boys break in and then this corrective preference does not succeed.

As aforementioned, the problem is an actual one and must be addressed with all the means at our disposal. New and creative ways of dealing with this problem must be produced.

Research Hypotheses

The hypotheses were that there is a relationship between the teacher's behavior in the class and the students' achievements. There is a relationship between the teacher's behavior in the class and the increase of the girls' motivation and the increase of their achievements. There is no doubt that personal communication increases the motivation, which increases the achievements.

Computerized tasks are one of the methods for the creation of communication between the teacher and the students. The integration of the computer is a wonderful way to create communication.

Without a doubt we speak differently to boys than to girls. If we create corrective preference, then we will see a change.

In a courageous personal examination, it is apparent that I speak differently to girls and to boys. I address girls and boys differently. My starting point is that the students who are good at mathematics are boys, they are brilliant, they are creative, they think outside of the box. If a girl succeeds in mathematics, then it is because of her order and organization, because she knows the algorithm – and not because she is smart, creative, or possessed of mathematical thinking.

I refer to the boys in the mathematical discussions in the classroom. I let them answer the questions, I run ahead with the ones who interrupt. It is not really important that some of the students are not with us, since the girls are quiet and most do not cooperate but at best listen. We hold a discussion, answer questions, draw conclusions, and move onwards. Time is precious in the higher classes. There is much material to learn, much to do, and it is necessary to be quick.

The girls and some of the boys copy the conclusions into their notebooks and they must use them in their assignments. They did not reach these conclusions; they accepted them from the teacher like the Ten Commandments.

It is very comfortable to race ahead with those who understand, to summarize, and to give work, to return and provide another review for most of the students who are not there yet. Thus, I have a chance to finish the material that I must finish. The third review I will give those who did not yet

understand, even after the second explanation. Here I will sit and explain in another way so as not to do 'more of the same' since it does not help if I explain one hundred times in the same way.

The learning occurs in waves, three waves for every topic. The first wave is caught by the excellent and very good students. The good and average students catch the second wave, while the weak students are on the third wave. It is not certain that the latter will make the beach.

The results show that the gap between the boys and the girls exists.

I need to make a change and empower the girls. It is clear to me that in the beginning it will seem artificial. It is clear to me that I must work on myself and put forth effort. I must be careful not to run with the boys, not to let them interrupt, not to be enthusiastic with their quick thinking but to work differently. Will I succeed? I am not certain. The task is not an easy one.

In the framework of the start of another work with the girls, I began to meet them on a regular basis, once a week, for two meetings with the girls, and the one meeting with the boys, for meetings at a ratio of 2:1 in the girls' favor. The idea was female empowerment in parallel to the maintenance of continuous communication with the boys.

The communication with the girls developed nicely. We created relations and maintained communication in face-to-face conversations, communication in emails and WhatsApp in case of emergency. The communication with the boys was maintained. I encouraged the group of girls to do and to succeed. Success for me was the creation of conversation and interpersonal communication, empowerment, and the girls' voice. Success constituted the request to volunteer for another week in the road safety duty, a request that was received and performed by the girls at first with amazing attendance – this is the female power at its finest! The girls learned to make their voices heard and to display their presence! The girls learned slowly to show their presence and to undertake the activity in the class.

In the framework of the empowerment, I suggested to a group of five girls to stay with me for a lesson at the end of the day, once a week. The goal of the lesson was empowerment. In this lesson we played thinking games and engaged in different mathematics, including riddles and games. The students had fun in the lesson, acquired self-confidence, and went with me to other classes to hold lessons and to teach other students. The students went with me into all the classes, from first glade till sixth grade. The girls' self-confidence rose and accordingly their success in the lessons increased. They dared more to try and thus they succeeded.

The girls succeeded in every area in which they worked and especially in the computerized tasks that they received as a summary of the topic for home, in which they needed to summarize the topic. Sometimes they needed to find additional material online, prepare it in a document, send it, and succeed in presenting the work to the entire class.

Research Results

Towards the middle of the year, we held another set of checks, examining the girls' scores and their participation. We held interviews, distributed questionnaires, and collected data.

In the examination of the girls' scores in the midyear test, a change was apparent. In addition, the problem that constituted the motive for the research process was the differences between boys and girls in the mathematical achievements and the differences in the participation of the students in in the class discourse during the lesson.

Identical tests were held in the middle of the year. A change was apparent from the examination of the students' achievements. (See tables number 8-11.)

Following the observation held in the lessons, it was apparent that more girls began to participate in the lessons. (See tables number 12 and 13.)

In an anonymous questionnaire distributed among the students, with the goal of examining possible explanations for the nature of the phenomenon, differences were apparent in the attribution of the reasons for the participation and non-participation of members of both sexes in the lessons. (See table number 14). It was apparent that there was a change in the attribution of the reasons for success and failure.

In an interview conducted with the teachers, it was apparent that this phenomenon indeed was reduced. There still is a difference between the achievements of the boys and girls and in their cooperation. However, a change is apparent, namely, we are succeeding in creating the desired change.

Examination of the students' achievements indicates a difference between the scores of the boys and the girls (See tables number 8-11).

Table Number 8

Student	Score
A	98
B	88
C	89
D	78
E	86
F	80
G	84
H	87
I	91
J	81
K	85
L	94
Mean	87

Table Number 9

Student	Score
A	95
B	94
C	93
D	86
E	87
F	88
G	94
H	87
I	87
J	81
K	85
Mean	89

In the first class the mean score of the girls was 87 and the mean score of the boys was 89.

Table Number 10

Student	Score
V	87
U	98
T	89
S	87
R	89
Q	93
P	86
O	99
N	93
M	89
L	91
K	100
J	98
I	72
Mean	91

Table Number 11

Student	Score
V	89
U	86
T	97
S	89
R	99
Q	96
P	95
O	79
N	95
M	88
L	96
K	100
J	88
I	89
Mean	92

In the second class the mean score of the girls was 91, very close to the mean score of the boys, 92.

Following the self-reporting of teachers and following an observation held in the lessons, it was apparent that most of the participants in the dis-

cussions that occur in the lesson are boys. (See tables number 12 and 13.) However, the number of girls who participate has risen greatly.

Table Number 12
First Class

Lesson	Participation Boys	Participation Girls
1	14	8
2	17	9
3	12	7
4	13	12
5	19	11
6	15	16
Mean	15	11

In the first class the mean score of the participation of the girls is 11, while the mean score of participation of the boys is 15.

Table Number 13
Second Class

Lesson	Participation Boys	Participation Girls
1	13	5
2	12	7
3	13	4
4	19	17
5	22	16
6	13	9
Mean	15	9

In the second class the mean score of the participation of the girls is 9, while the mean score of participation of the boys is 15.

In both classes the greater participation of the girls than at the beginning of the process is apparent.

In an anonymous questionnaire that was distributed to the students, with the goal of examining possible explanations of the nature of the phenomenon, differences were apparent in the attribution of reasons for participation and non-participation of members of both sexes in the lesson. (See the questionnaire in the appendix.)

Each one of the students was supposed to address each one of the statements and to give it a score from 1 to 5.

Table Number 14

Reason	Score Boys	Score Girls
I understand the topics studied in mathematics.	4.5	4.2
I succeed in getting good grades in mathematics.	4	3.9
I have not mastered the topics studied in mathematics.	1.7	2.5

Reason	Score Boys	Score Girls
I am missing prior knowledge in mathematics.	1.4	2.2
I do not understand the topics studied in mathematics.	1	2.1
I like studying mathematics.	4.9	3.3
I do not like studying mathematics.	0.4	1.5
I quickly understand new topics of study in mathematics.	4.8	4.2
I need additional study to understand new topics of study in mathematics.	2.1	2.3
It is not easy for me to understand and learn new topics of study in mathematics.	1.3	1.2

The score presented is the mean of the responses according to gender. After the intervention, change is apparent. Boys still have a sense of efficacy, optimism, belief in ability, and self-confidence and in parallel among girls these topics are developing. A change is manifest. Fewer girls reported lack of belief in ability, in success, in efficacy, and fewer girls reported lack of optimism.

In an interview held with the teachers, it was apparent that this phenomenon indeed exists. There is a difference between the achievements of the boys and the girls and in their cooperation. However, we feel the change. In an interview with the teachers, different reasons were attributed to the participation and non-participation in the lessons (see table number 14) and the developing change is apparent.

In the interview with the first teacher, it was apparent that a change had occurred. Girls began to participate more in lessons and to succeed more in the tests. The girls began to understand their ability. They experienced experiences of success and then even if they tried and did not succeed, they learned not to give up on themselves. The girls began to dare. The girls succeeded in increasing their achievements.

In the interview with the second teacher, it was reported that the girls succeeded in raising their achievements. The girls began to participate more in the lessons and to cooperate. The girls rose to the challenge and each time she asked a question and performed corrective preference they answered the question. Some of them even learned to interrupt.

We succeeded in addressing the problem with creative means, and it was apparent that we had performed a change. The continuation of the change depends on the continuation of the work.

Personal Reflection on Ourselves in the Process and on the Process

The research study contributed to me greatly, from thinking about myself, my behavior, and the implications of my behavior. I succeeded in bringing myself to the thinking about change of behavior for the change of the products, namely, I understood that I had to change my behavior so that the behavior of the students, the girl students, would change.

In essence, I changed my behavior for a change in the behavior of the girls, and this is what happened. The truth is that in the beginning everything was forced, but after the first products began to appear, I received considerable reinforcement of my behavior and my actions. The reinforcement of the way of work and the continuation of the activity flowed naturally and with great enthusiasm.

If I look at myself, then great development began here. I furthered my awareness as a person and as a teacher, I empowered my efficacy. My professionalism grew and accordingly the flexibility in the entire process.

I am proud of my activity, which derived from strong belief in my ability and the courage to look at the difficulties and lack of successes in order to make a change. The success must make a large and essential change in my personal conduct and the products. I hope that additional teachers can attempt this important and beneficial process.

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Appendix: Research Questionnaire

I Am in Mathematics Lesson – Efficacy, Optimism, Belief in Ability, and Self-Confidence

In the following questionnaire read carefully the statements and indicate the response that most accurately reflects your conduct in the mathematics lessons. Your honest responses can reflect the situation and help us better understand the reasons for the participation and non-participation of members of both sexes in the mathematics lesson. Thank you for your cooperation – our goal is shared!

Sex: Male Female

		Generally do not agree				Always agree
1	I understand the topics studied in mathematics.	1	2	3	4	5
2	I succeed in getting good grades in mathematics.	1	2	3	4	5
3	I have not mastered the topics studied in mathematics.	1	2	3	4	5
4	I am missing prior knowledge in mathematics.	1	2	3	4	5
5	I do not understand the topics studied in mathematics.	1	2	3	4	5
6	I like studying mathematics.	1	2	3	4	5
7	I do not like studying mathematics.	1	2	3	4	5
8	I quickly understand new topics of study in mathematics.	1	2	3	4	5
9	I need additional study to understand new topics of study in mathematics.	1	2	3	4	5
10	It is not easy for me to understand and learn new topics of study in mathematics.	1	2	3	4	5

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Thank you for the privilege of being there! Of looking at what is being done, of examining it, and of daring to change. Without you – I would not be able to do it. With your great help and because of you, I advanced and now I will continue in this direction – of daring and changing. "The wisdom to see, the courage to want, and the strength to do." (Berl Katznelson)