

Article

Coaching-Based Pedagogy and Its Impact on Students' Self-Regulation among Marginalized and Segregated Communities: Palestinian Arab Middle School Students as a Case Study

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Abstract: (1) Background: This study aimed to examine the effect of assimilating coaching tools among educational staff on the cultivation of (emotional, behavioral, and cognitive) self-regulation skills among Palestinian Arab middle school students in Israel. Little attention has been paid to the relationship between coaching-based teaching and students' self-regulation among middle school students, let alone students from segregated and disadvantaged communities worldwide. (2) Methods: A quasi-experimental study was designed to test the hypothesis that there are differences in self-regulation between students who participate in coaching-based teaching and those who do not. Six hundred Palestinian Arab middle school students participated in this study and were randomly assigned to two groups: an experimental group ($n = 300$) and a control group ($n = 300$). All participants completed a pre- and post-test instrument that included the Adolescent Self-Regulatory Inventory (ASRI), and repeated-measures ANOVAs were used to analyze the data. Repeated-measures analysis of variance was employed to examine the effect of coaching on the students' level of self-regulation. To examine the sources of the differences, Tukey's post hoc tests were used. (3) Results: A statistically significant correlation between coaching-based education and students' ability to take responsibility and ownership for their own learning was revealed. The results showed that the mean of the self-regulation variable before the intervention in the experimental group was significantly lower than that after the intervention ($t = -13.70, p < 0.001$) and that the mean of the experimental group after the intervention was significantly higher than that of the control group after the intervention ($t = 29.62, p < 0.001$). Furthermore, there were significant effects on self-regulation at the time of measurement (before and after the intervention) ($F(1, 299) = 49.87, p < 0.001$) and for the participant group ($F(1, 299) = 497.13, p < 0.001$). In addition, no significant difference was found in the self-regulation mean score for the control group before and after the intervention ($t = 0.55, p > 0.05$). These results demonstrate that coaching had a positive effect on the participants' level of self-regulation. Recommendations: We recommend that coaching-based pedagogy be incorporated into the education system, in general, and in education systems that serve the needs of marginalized and disadvantaged communities, in particular.

Keywords: educational coaching; coaching tools; self-regulation; segregated communities; Palestinian Arabs



Citation: Shatroubi, T.; Ramirez-Garcia, A. Coaching-Based Pedagogy and Its Impact on Students' Self-Regulation among Marginalized and Segregated Communities: Palestinian Arab Middle School Students as a Case Study. *Educ. Sci.* **2023**, *13*, 527. <https://doi.org/10.3390/educsci13050527>

Academic Editor: Kendall Hartley

Received: 10 April 2023

Revised: 16 May 2023

Accepted: 19 May 2023

Published: 21 May 2023



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1. Introduction

For many years, the Palestinian Arab education system in Israel proper has been affected by discrimination and underfunding compared with the Jewish education system. Both the curriculum itself and its implementation not only de-nationalize the Palestinian Arab students and alienate them from their cultural heritage and history but also fail to provide students in the Palestinian Arab education system with the knowledge and skills

necessary for future integration in the labor market. This two-tiered educational system in Israel prevents students from realizing their potential.

The Israeli education system has attempted to implement many reforms to promote 21st century skills, including high-order thinking, technological skills, and life skills, but most of these reforms were only partially implemented or not implemented at all. Consequently, traditional face-to-face teaching has remained predominant. As Eisenberg and Selivansky (noted, the readiness of the Israeli education system for the 21st century reveals many deficiencies [1]. They also claimed that the curriculum in the Israeli education system has not been adapted to the 21st century. Israel is generally ranked low in international tests such as the Programme for International Student Assessment (PISA) and Program for the International Assessment of Adult Competencies (PIAAC). The Israeli educational system does not provide students with the necessary skills or prepare them for future employment [1].

This is even more true for the Palestinian Arab education system in Israel, which functions as a segregated subsystem within the larger state education system. As such, the education system in Israel is characterized by deep gaps and disparities between students from different socioeconomic backgrounds as a result of the budget allocated to the development of each system and their curricula per student [2]. Analysis of international tests such as the PISA has also shown that Arab children's scores are even lower than those of their Jewish counterparts [3]. Furthermore, there are indications that the quality of teachers in the Palestinian Arab education system, which, in some ways, had previously been higher than that in the Hebrew education system, is decreasing [3]. The main barriers that stand in the way are undertrained teachers, teacher training programs that do not support innovative teaching methods, a centralized education system, a cumbersome organizational structure, and frequent political changes [4].

In addition, the Palestinian Arab education system in Israel prioritizes academic excellence to the extent that it neglects "the social, intellectual, and emotional needs of the students" [5]. Developing skills that fit the future employment market could increase the Arab population's human capital and lead to the realization of their economic potential, particularly because a considerable number of Arab employees (mainly men) have low-level skills and are at risk of becoming unemployed [1]. Although there is no consensus about the set of skills that graduates will need, Newton and Zepeda et al. agreed that abilities and skills that are considered unique to humans and cannot be replaced by machines are important for future market integration [6,7]. These include critical thinking, problem solving in a digital environment, information management, collaboration and teamwork, and ethical, legal, and cultural awareness. Moreover, recent studies [6,7] have shown the need to cultivate self-regulation skills among students to achieve these goals, a topic that has not received much attention from educators in Palestinian Arab society.

1.1. Self-Regulation

Previous studies showed that a high level of self-regulation skills in learning (emotional, behavioral, and cognitive) is key to academic success, self-efficacy, quality of life, and the advancement of emotional and social abilities [8–10]. This applies to students in general but is particularly relevant to students from underprivileged populations [11,12]. The definition of self-regulation has evolved over time [13]; however, the earliest definition relates to the ability to control behaviors and emotions [14]. The idea of controlling behaviors, emotions, and cognition to accomplish a set goal, from its formulation to its execution and the evaluation of the results, was later proposed by Zimmerman and Bauer and Baumeister [15,16]. Pintrich viewed self-regulation as a mental process based on meta-cognitive strategies and knowledge that aim to realize a person's goals, such as achievement, personal aspirations, objectives, and aspirations in interpersonal relationships [17].

Self-regulated learning (SRL) refers to the way in which learners—at any age and in any learning situation—handle and participate in the learning practice in order to accomplish learning objectives. The basic principle of the pedagogy of self-regulation is students'

participation in educational processes in the classroom. Consequently, teaching according to this approach must begin with setting goals together with the students, while sensitively listening to their needs and supporting their planning, combined with supervision and evaluation steps to help them. Key factors that shaped teachers' experiences were their active partnership with the students and the fact that the students were responsible for the success of the process. Lichtinger described how sharing with students changed teachers' awareness of classroom relationships, and they stopped perceiving students as passive and oppositional [18]. Schuster et al. also described how they began to perceive themselves as working together with their students rather than against them [19]. The central perspective that emerges from research, as well as from ongoing experience, is that listening to students at risk and working together to obtain their ambitions are key tools for meeting them in the classroom [19].

Several models of learning regulation processes have been described in the literature, although they all comprise the same general assumptions and characteristics. According to Zimmerman, learning is not something that happens to learners but something that happens through learners [20]. In other words, learners are not just passive consumers of information received from teachers or parents; they are dynamic and actively build meanings and interpretations throughout the process. Moreover, Pintrich proposed a self-regulation learning model that includes four interrelated stages that represent the actions that learners should take when performing a task:

1. Thinking and planning goals based on prior knowledge and time management, effort, and self-observation of behavior.
2. Monitoring meta-cognitive awareness of awareness, motivation, effort investment, and the need for self-observation.
3. Focusing efforts to control and regulate various aspects of the self, tasks, and contexts.
4. Receiving feedback and cognitive judgment, choice, and the evaluation of the task.
5. These steps are not necessarily hierarchical and are sometimes performed simultaneously or in different orders [17].

The common assumption in these studies is that all learners can control and monitor their own thinking, motivation, and behavior, as well as the characteristics of their external environment [17]. Furthermore, learners can check their learning progress by comparing their existing situation to their desired one (or any target they set at the beginning of the practice) to assess whether they should proceed on the same path already undertaken or make some changes in order to achieve their goals [21]). Regulation areas refer to the different spaces in which students may perform follow-up routines, control, and regulation: cognition, motivation, behavior, and context [22].

The literature on this topic points to a positive relationship between self-regulation ability in learning and academic achievement [23,24]. Students who developed learning regulation tools were more successful in performing academic tasks and had higher academic success than those students whose learning regulation skills were underdeveloped. However, learners with high SRL capacity are not necessarily more intelligent than students whose self-regulation competencies are not developed, considering the fact that for the former group, a high level of self-regulation routine in learning is key to academic success. It is important to note that self-regulation in learning is not a general trait that some learners have and others do not [25]. Moreover, a setting that promotes self-regulation is very important for developing these skills, since it allows students to choose their way of working, as well as a safe atmosphere with a collaborative and warm environment. Under these circumstances, the student can develop and express his or her worldview and improve academically [18].

1.2. Coaching

Coaching in education has received increasing interest over the last few decades [26–28]. Al Hilali et al. argued that by virtue of being goal-oriented, controlled, and reflective, the coaching process is a model for effective learning and that it is important to include the ra-

tionale of coaching as a model for effective learning in the educational system [29]. Schools, colleges, and universities in Australia, the United Kingdom, and the USA have introduced coaching interventions to obtain better results for learners [30–32]. The term ‘coaching in education’ covers a broad range of interventions that aim to improve outcomes for learners within educational settings. The term ‘school coaching’ or ‘coaching in education’ has been defined as follows:

A one-to-one conversation focused on the enhancement of learning and development through increasing self-awareness and a sense of personal responsibility, where the teacher-coach facilitates the self-directed learning of the student through questioning, active listening, and appropriate challenges in a supportive and encouraging climate [32].

In these terms, good tutors can be defined as leaders who use coaching tools to handle the challenges of the 21st century’s complex reality for the sake of teaching and educating scholars. In other words, the educator’s role as a coach is to boost students’ efforts to achieve the best possible results in both the short and long term. To be successful, the teacher-coach requires knowledge and understanding of the process, as well as a variety of styles, skills, and techniques that are appropriate to the context in which the coaching takes place, in the following ways:

1. Allow the learners to make the right decisions from an overall view of all possible events and build a success strategy as the most appropriate course of action.
2. Create a teaching/learning framework that allows students to focus on the best available resources and abilities so as to achieve excellent results.
3. Help the learners to set performance patterns and address the inevitable crises that may arise on their way to the starting point.
4. Serve as a partner, friend, mentor, guide, or supporter on an equal basis.
5. Define the students’ vision and aspirations as the main factors driving the process.
6. Motivate the learners to identify the assets that suit them best and design the best strategies and solutions for themselves.
7. Bring students to a place where they can optimally realize the potential of their personal, social, professional, and economic means.
8. Help them to locate the factors crucial to their success and form successful strategies that lead to the highest level of accomplishment.
9. In addition, educators must provide students with independent direction and control resources, which will guide them to make the most appropriate decisions based on their own growth and desired results [29,33–36].

Studies have found a positive relationship between coaching and learning skills. Coaching can reduce feelings of stress, increase goal achievement, strengthen one’s sense of control, and increase life satisfaction [37,38]. Coaching has also been found to increase students’ perseverance and retention [39]; increase satisfaction with school [40]; improve students’ test success [41]; help to achieve goals [42–44]; and instill learning strategies, self-esteem, self-confidence, and motivation [45–48].

Today, coaching is seen as a useful method for helping the learner to succeed personally and professionally, with the goal of reaching maximum potential and learning the skills required for our modern world [49]. Students learn to overcome obstacles that are expected to affect their ability to achieve their goals, develop strategies for dealing with these obstacles, and identify potential channels of assistance [50].

The Impact of Teachers’ Use of Coaching Tools on Students’ Self-Regulation Skills

Recent studies [51,52] have shown that the use of teaching strategies based on coaching improves teaching. Teaching through coaching involves using a pedagogical approach tailored to students’ requirements for learning autonomously and independently. It refers to the ability to do so as a basic aptitude for life in the 21st century and a strength required to continue learning throughout life in an ever-changing world. A new concept of the “good” teacher is one that recognizes the educator as a “coach”, or a teacher using coaching tools and equipped with coaching skills. These studies have also indicated a mutual

relationship and interaction between self-regulation and academic achievement. Therefore, it is important to appraise the use of personal resources (including areas of power) in planning intervention and training programs to prevent the erosion of self-forces [53].

According to Janes et al., the teacher-coach creates a training framework that permits learners to focus on the best assets and abilities available to them in order to achieve optimal results, taking the students to a state where they can optimally reach their potential based on their personal, social, and economic resources [33]. Additionally, he/she motivates his/her students to identify the assets that suit them the best and to produce their own best strategies and solutions. Ramdial-Budhai) argued that some of the most important skills a coach teaches students are independent management, monitoring, and control mechanisms, which lead them to the best decisions in terms of coaching and outcomes [52]. These tools allow students to be aware of their thinking and ability to self-regulate, control their decision-making process, and criticize their own learning. The teacher-coach improves the planning, monitoring, and control procedures of the thinking strategies that pupils internalize. This helps them to pay more attention to their thought systems and be aware of the task in order to gather information about it and deal with it accordingly [54–56].

Supported by dialogic teaching, educators with coaching experience can focus their guidance on promoting individual students' self-learning abilities and preparing them to face future challenges. The teacher-coach helps students to improve their self-regulation and self-management skills, and this is mirrored in their ability to take responsibility for, and ownership of, their own learning. Furthermore, it greatly influences student behavior. Discipline issues were significantly reduced, allowing students to be more involved in their own learning and able to solve complex and challenging problems. Students do not give up when facing difficulties, and this helps them to learn in greater depth, mastering the adjustment to adult life outside school [33,35,36,52].

Considering the impact of the role of coaches on students' (emotional, behavioral, and cognitive) self-regulation, it is important to analyze this relationship in disadvantaged and marginalized communities around the world. Therefore, this study aimed to examine the effect of assimilating coaching tools among educational staff in Israel on the cultivation of self-regulation skills among Palestinian Arab middle school students by testing the following hypothesis: There is a positive relationship between coaching-based teaching strategies and students' self-regulation ability. To our knowledge, no study has previously examined this relationship among this student population.

2. Methodology

2.1. Research Design

A quasi-experimental study was conducted to evaluate the association between a given intervention (not randomly assigned) and the outcomes. A total of 600 7th- to 9th-grade students (268 males and 332 females) were divided into two groups: 300 participated in the coaching program throughout the school year, and 300 students were the control group. The background data of the two groups were similar.

Table 1 presents the students' distribution by gender and shows that the numbers of boys and girls in both groups were similar. The difference between the groups was not statistically significant ($\chi^2_{(1)} = 0.00; p > 0.05$).

Table 2 presents the students' distribution by age (grade at school) and shows that there was equal representation of each age group in both the research and control groups. The difference between the groups was not statistically significant ($\chi^2_{(1)} = 0.00; p > 0.05$).

Table 3 presents the distribution of the participants according to their fathers' education. The data in Table 3 show that the frequency of fathers with a middle school education was the highest ($n = 106$) in the control group. On the other hand, in the research group, the frequency of fathers with a high school education was the highest ($n = 152$). The difference between the groups was not statistically significant ($\chi^2_{(1)} = 0.00; p > 0.05$).

Table 1. Frequencies and percentages for gender.

Group	Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Control	Boys	134	44.66	44.66	44.66
	Girls	166	55.33	55.33	100.00
	Total	300	100.00		
Experimental	Boys	134	44.66	44.66	44.66
	Girls	166	55.33	55.33	100.00
	Total	300	100.00		

Table 2. Frequencies and percentages for grade.

Group	Grade	Frequency	Percent	Valid Percent	Cumulative Percent
Control	7	100	33.33	33.33	33.33
	8	100	33.33	33.33	66.66
	9	100	33.33	33.33	100.00
	Total	300			
Experimental	7	100	33.33	33.33	33.33
	8	100	33.33	33.33	66.66
	9	100	33.33	33.33	100.00
	Total	300	100.00		

Table 3. Frequencies and percentages for fathers' education.

Group	Father's Education	Frequency	Percent	Valid Percent	Cumulative Percent
Control	None	0	0.00	0.00	0.00
	Elementary	10	3.33	3.33	3.33
	Middle school	106	35.33	35.33	38.66
	High school	138	46.00	46.00	84.66
	Academic	46	15.33	15.33	100.00
	Total	300	100.00		
Experimental	None	2	0.66	0.66	0.66
	Elementary	8	2.66	2.66	3.33
	Middle school	84	28.00	28.00	31.33
	High school	152	50.66	50.66	82.00
	Academic	54	18.00	18.00	100.00
	Total	300	100.00		

Table 4 presents the distribution of the participants according to their mothers' education. Table 4 shows that the frequency and percentage of mothers with a high school education in both the control and experimental groups were the highest ($n = 152$ and $n = 160$, respectively). The difference between the groups was not statistically significant ($\chi^2_{(1)} = 0.00$; $p > 0.05$).

Table 4. Frequencies and percentages for mothers' education.

Group	Mother's Education	Frequency	Percent	Valid Percent	Cumulative Percent
Control	Elementary	14	4.66	4.66	4.66
	Middle school	62	20.66	20.66	25.33
	High school	152	50.66	50.66	76.00
	Academic	72	24.00	23.33	99.33
	Total	300			
Experimental	Elementary	8	2.66	2.66	2.66
	Middle school	36	12.00	12.00	14.66
	High school	160	53.33	53.33	68.00
	Academic	96	32.00	32.00	100.00
	Total	300			

As for the teachers, teachers in the experimental group underwent coaching training, whereas teachers in the control group did not. Table 5 presents the distribution of teachers in both groups by gender, age, education, and seniority.

Table 5. Distribution of teachers according to gender, age, and education levels.

Group	Number of Teachers		Average Age	Education			Seniority
	female	male		B.A	M.A	Ph.D.	
Control	37	5	41	21	21	0	19
Experimental	35	10	44	21	23	1	20

The training involved the development of a guided process that would help the trainees to clarify their values, strengths, and priorities and to realize their potential to effectively obtain the desired results and achieve the goals they had set for themselves. This training program was structured into 13 sessions and culminated in a 20 h practicum. Sessions 1–5 introduced the coaching training program and presented general information about the coaching models, tools, and methods; educational theories and approaches in relation to coaching, teaching, and learning; and personal leadership, especially values, personal vision, and the acts of building a work plan and setting goals. Sessions 6–9 provided hands-on experience with coaching tools for empowerment, listening, and identifying paradigms; dealing with restraints such as habits, excuses, self-image, comfort zones, labels, fears, and paradigms; dealing with motivators, including positive thinking and how it is carried out; and identifying values, writing a vision, building an action plan, measurement, and accompaniment. Sessions 10–11 introduced teachers to strategies that empowered them to develop skills for metacognition, self-regulation management, social-emotional processes, and listening skills among students. Sessions 12–13 developed coaching and interpersonal skills such as empowerment, diagnosis, identifying paradigms, listening, asking questions, encouraging students to talk, reflecting, reframing, dealing with objections and enhancing the coach-coachee relationship through communication, listening and dialog skills, ethics, building a professional relationship, boundaries, transference and countertransference in coaching, additional forms of communication, and ethical issues during the process. At the end of the training program, the teachers were expected to perform 20 h of personal practicum at the school.

2.2. The Instruments

The technique employed was a survey, and the instrument used was a questionnaire. The questionnaire was a closed self-report questionnaire, which included two parts: 1. Demographics; and 2. Self-regulation.

Part 1: Demographics

This part of the questionnaire related to the students' background characteristics: gender (nominal dichotomous variable: 1 = boys, 2 = girls); grade (1 = 7th, 2 = 8th, 3 = 9th); father's education (1 = elementary school, 2 = middle school, 3 = high school, 4 = academic); mother's education (1 = elementary school, 2 = middle school, 3 = high school, 4 = academic); and siblings (ordinal number).

Part 2: Self-regulation

The assessment of self-regulation in this study utilized the Adolescent Self-Regulatory Inventory (ASRI) developed by Moilanen [57]. The ASRI is designed to measure five key components of self-regulation: the monitoring of activation, adaptation, maintenance, and inhibition. It also encompasses four areas of self-regulation: emotional, behavioral, cognitive, and attentional. In addition, the inventory incorporates two time-related aspects, focusing on both short- and long-term self-regulatory processes.

To ensure linguistic equivalence, the ASRI questionnaire was meticulously translated into Hebrew using the rigorous back-translation method of Selkovski [58]. A pilot study involving 50 adolescents was conducted to assess the quality of the translated version. The questionnaire consisted of 27 items, with items 1–13 specifically addressing short-term self-regulation and items 14–27 pertaining to long-term self-regulation.

Consistent with previous research conducted by Selkovski [58], the final score for self-regulation was computed as the average of the item responses. Certain items (1, 2, 3, 6, 7, 8, 10, 11, 12, and 16) were reverse-coded to ensure accuracy in the scoring process. Selkovski [58] reported satisfactory reliability for the long-term section ($\alpha = 0.80$), while the short-term items exhibited slightly lower reliability ($\alpha = 0.60$). In the present study, the overall reliability coefficient for the self-regulation questionnaire was $\alpha = 0.60$.

Sample items from the ASRI questionnaire include: "If I engage in an action and recognize its wrongness, I approach it with caution" and "When I find a lesson uninteresting, it becomes challenging for me to compel myself to listen to the teacher."

2.3. Procedure

All participants completed a pre- and post-test instrument that included the Adolescent Self-Regulatory Inventory (ASRI) [57], which measures five components of self-regulation (activating, monitoring, maintaining, inhibiting, and adapting), four areas of self-regulation (emotional, behavioral, cognitive, and attention), and two time-related aspects (short- and long-term). The questionnaire included 27 items, with items 1–13 relating to the short term and items 14–27 relating to the long term.

The questionnaires were distributed to the students twice: once before participating in the program (beginning of school year of 2020) and once at the end of the school year. The questionnaires were distributed at school during a class session. The students received verbal information about the study's goals, use of data, and participant consent, as well as instructions on how to complete the questionnaire. Additional instructions were provided to students who had difficulties with some questions. On average, completing the questionnaires took approximately 45 min. Afterwards, the homeroom teachers were asked to mark the forms of the students identified as having a learning disability and/or attention deficit disorder in the system. This study did not include students with either learning disabilities or attention deficit disorders. This study was approved by the Ethics Committee of the Israeli Ministry of Education, school principals, and the students' parents.

2.4. Data Analysis

The skewness and kurtosis values were used to determine the normality of the sample distribution. Chi-square (χ^2) tests were conducted to examine the differences in student

background. Furthermore, confirmatory factor analysis (CFA) was used to validate the construct of the meta-cognitive variable using Jamovi software.

To examine differences in the research variable, self-regulation, between the experimental and control groups before and after the intervention, repeated-measures ANOVA analysis was used. Pearson's correlations were also used to determine correlations between the main variables (coaching and self-regulation). Statistical analyses were performed using SPSS (ver. 24) statistical software.

3. Results

Table 6 presents the results for self-regulation by group (experimental and control groups) before the intervention. The findings indicate that the total scores for self-regulation were identical for both groups ($M = 2.89$); the participants perceived themselves as having above-average self-regulation. The results showed very few differences between the two groups in terms of the scores for the individual items.

Table 6. Self-regulation by group before the intervention.

Item #	Before the Intervention Item	Control Group		Experimental Group	
		Mean	SD	Mean	SD
	Self-regulation (total)	2.89	1.07	2.89	0.87
1	When I am sad, I can start doing something that makes me feel better.	3.56	1.21	3.56	0.87
2	When I am bored, I become agitated and cannot sit still.	2.45	1.23	2.44	0.89
3	When I fight with someone, I can still behave normally with others.	2.90	1.31	2.90	0.82
4	I can keep track of many things around me, even when I am stressed.	2.67	1.31	2.69	0.73
5	I can start a new task even if I am tired.	4.03	0.97	3.90	0.92
6	Small problems sidetrack me from my long-term plans.	2.96	1.42	3.03	0.93
7	When I do something really enjoyable, I forget about other things I have to do.	3.27	0.91	3.10	1.23
8	When a lesson bores me, I find it hard to listen to the teacher.	2.92	1.25	2.91	0.80
9	After someone disturbs or distracts me, I can easily continue working from where I stopped.	1.00	0.95	1.05	0.87
10	When a lot of things happen around me, I find it hard to concentrate on what I am doing.	0.95	0.97	0.97	0.83
11	I never know how many things I have to do.	4.03	0.83	4.05	0.80
12	It's hard to plan how to deal with a big project or big problem, especially when I am stressed.	2.84	0.84	2.84	0.91
13	I know how to calm myself when I am excited or upset.	3.15	0.94	3.13	0.90
14	If my plan goes wrong, I change my behavior in order to achieve my goals in spite of it.	3.19	0.80	3.19	0.77
15	I know how to make myself study, even when my friends invite me out.	4.00	0.89	3.91	0.85
16	I lose control when things do not go the way I want them to.	1.00	0.86	1.05	0.84
17	If I really want something, I have to have it immediately.	2.60	1.00	2.67	0.89
18	When I have a serious difference of opinion with someone, I can still talk to them calmly without losing control.	2.55	1.22	2.59	0.82
19	I can keep concentrating on a task, even if it's boring.	2.84	1.12	2.84	0.91
20	When I am furious, I can stop myself from acting out (like slamming a door or throwing things).	3.15	0.94	3.13	0.90
21	If I do something that I know is wrong, I act carefully.	2.84	1.09	2.86	1.00
22	I am usually aware of my feelings before they burst out.	2.38	1.05	2.36	0.67
23	In class, I can concentrate on the lesson, even if my friends are talking around me.	2.97	1.17	2.99	1.01
24	When I am excited about achieving a goal (for instance, getting a driver's license), it's easy for me to make an effort for that goal.	3.48	1.00	3.44	0.96
25	I can stick to my plans and goals, even when it's difficult.	3.48	0.97	3.47	0.66
26	I can persevere and work on a project, even when it's something big.	3.57	1.23	3.58	0.85
27	I can restrain myself from doing something that is forbidden.	3.42	1.25	3.44	0.73

Figure 1 shows a comparison of the means of self-regulation for both groups before and after the intervention. The results show that the self-regulation means of the two groups before the intervention were equal ($M = 2.89$), but the mean of the experimental group increased significantly ($M = 3.49$) following the intervention, as compared to both groups prior to the intervention and the control group after the intervention. Moreover, the mean score of the control group after the intervention decreased slightly compared with that before the intervention.

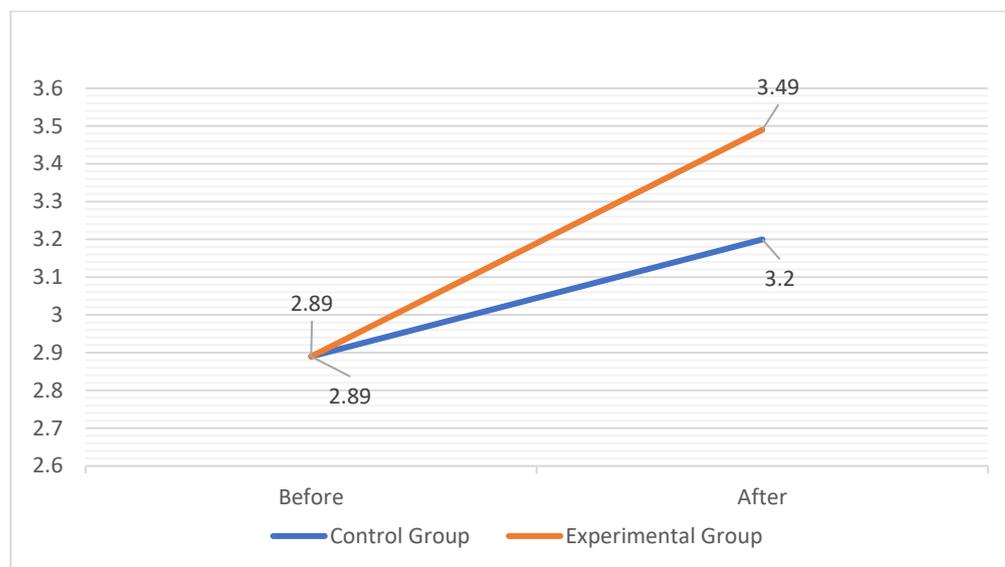


Figure 1. Self-regulation by group: means before and after the intervention.

Repeated-measures analysis of variance was employed to examine the effect of coaching on the students' level of self-regulation. As shown in Table 7, there was a significant effect on the interaction between time (before and after the intervention) and group (experimental group or control group) ($F_{(1, 299)} = 5.14, p < 0.001$). Furthermore, Table 7 shows that there were significant effects on self-regulation at the time of measurement (before and after the intervention) ($F_{(1, 299)} = 49.87, p < 0.001$) and for the participant group ($F_{(1, 299)} = 497.13, p < 0.001$).

Table 7. Effect of coaching on self-regulation.

Cases	Sum of Squares	df	Mean Square	F	η^2	η^2_p
Time	4.38	1.00	4.38	49.87 ***	0.09	0.143
Residuals	26.25	299	0.09			
Group	6.94	1.00	6.94	497.13 ***	0.14	0.624
Residuals	4.17	299	0.01			
Time * Group	5.14	1.00	5.14	382.75 ***	0.10	0.561
Residuals	4.02	299	0.01			

*** $p < 0.001$.

Tukey's post hoc tests were used to examine the source of the differences, as presented in Table 8. The results showed that the mean of the self-regulation variable before the intervention in the experimental group was significantly lower than that after the intervention ($t = -13.70, p < 0.001$) and that the mean of the experimental group after the intervention was significantly higher than that of the control group after the intervention ($t = 29.62, p < 0.001$). In addition, no significant difference was found in the means for self-regulation in the control group before and after the intervention ($t = 0.55, p > 0.05$). These results demonstrate that coaching had a positive effect on the participants' level of self-regulation.

Table 8. Self-regulation post hoc tests.

		Mean Difference	SE	t	P _{bonf}
Before, EG ¹	After, EG	−0.252	0.02	−13.70	<0.001 ***
	Before, CG	0.021	0.01	2.21	0.164
	After, CG	0.031	0.02	1.70	0.542
After, EG ¹	Before, CG	0.273	0.02	14.81	<0.001 ***
	After, CG	0.283	0.01	29.62	<0.001 ***
Before, CG ¹	After, CG	0.010	0.02	0.55	1.000

¹ EG = experimental group; CG = control group; *** $p < 0.001$.

4. Discussion

Differences in student self-regulation were found between the experimental (with coaching) and the control (without coaching) groups. These findings corroborated the hypothesis, and a positive relationship was found between coaching-based teaching strategies and students' self-regulation. The students who received coaching improved their self-regulation skills. Although the students' backgrounds were almost identical, the differences between the two groups were clear.

These findings are in line with the literature, according to which coaching has a statistically significant impact on students' self-regulation in comparison to students who do not receive coaching. Al Hilali et al. argued that by virtue of being goal-oriented, controlled, and reflective, the coaching process is a model for effective learning and that it is important to include the rationale of coaching as a model for effective learning in the educational system [29]. A study conducted in schools in England found that coaching in learning skills improved students' test success [41]. A study of postgraduate nursing students found that coaching enhanced learning due to the strong partnership formed between the student, coach, and academic institution [48]. Coaching has also been found to positively influence students by increasing their ability to set goals and their motivation to achieve them [59].

However, this study considered learning communities, which have rarely been examined in the literature. First, this study focused on Palestinian Arab students who are part of segregated and disadvantaged learning communities. The study revealed that coaching tools empowered the students to take responsibility for, and ownership of, their own learning, allowing them to be more involved in their own learning and able to solve complex and challenging problems. Second, previous studies [37,60–62] explored the advancement of skills and abilities with the help of coaching primarily among high school students. The present findings relate to middle school students, and the results also demonstrate that coaching in learning skills reduced symptoms of stress, anxiety, and depression, increased hope, quality of life, and resilience, and promoted goals.

Moreover, the findings of this study indicate that using coaching tools makes learning more effective. Previous studies have shown that learning rooted in the cognitive approach nurtures learners' self-regulation skills and improves their problem-solving capabilities. Students do not give up when facing difficulties, and this helps them to learn in greater depth, mastering the adjustment to adult life outside school [33,35,52,63]. These learning principles are based on metacognitive questions posed to oneself—What? When? Why? How?—during the three stages of developing the solution: planning, control, and assessment. These general questions are specifically targeted at the self-regulation stages and help the learner to integrate all the available knowledge during problem solving by developing new ideas, creating connections and insights, finding effective strategies, and developing one's thinking capacity.

Our study also shows that coaching tools allow students to be aware of their thinking and ability to self-regulate, control their decision-making process, and criticize their own

learning. The teacher-coach improves the planning, monitoring, and control procedures of the thinking strategies that the pupils internalize. This helps them to pay more attention to their thinking system and understand the task in order to gather information about it and deal with it accordingly [54–56]. This study validates previous research that has shown that there is a connection between coaching and learning skills and found that coaching is related to increased perseverance and persistence [39], the achievement of goals [44], management functioning and self-regulation [64], learning strategies, self-evaluation and satisfaction with school [40], and self-confidence and motivation [45]. Each of these outcomes reflects cognitive, metacognitive, or motivational concepts emphasized in the self-regulation theories.

5. Conclusions

The present study contributes to the growing empirical literature on educational coaching in education systems through its assessment of the effects of the intervention on students' self-regulation. This study suggests that educational coaching may be a promising and effective intervention for increasing students' self-regulation and an important complement to classroom-based interventions. Research has shown that coaching-based teaching leads to a significant positive change in the 21st-century school graduate. As such, we recommend incorporating coaching as a learning strategy in the education system. It is important to note that after the experiment was completed, all the coaching materials were transferred to the control group of students in order to remediate the effects of their lost opportunities.

The practical implications of this study are two-fold: First, each student in the education system can benefit from being taught and mentored by a teacher-coach to improve his or her self-regulation and other skills. Second, teachers should be given the opportunity to learn coaching. Coaching is a way of life that leads to remarkable performance and achievements. This field is concerned with defining a desired future and the means to accomplish it by raising the coachee's level of awareness and developing his or her personal and professional skills in order to realize goals.

This study had several limitations. The first limitation was the representativeness of the study sample. The study population consisted of adolescents from a Muslim Palestinian Arab town in northern Israel. Due to its religious homogeneity and largely medium to lower economic-social status, this town cannot be considered as representative of the Palestinian Arab population in Israel. Moreover, this study was based on self-reports provided by participants about their attitudes toward self-regulation capacities. Self-reporting is subjective, and there could have been a degree of social desirability in the respondents' replies. Finally, the data were collected over a one-year period. A more longitudinal investigation of the effectiveness of the intervention program, after it ended, would have more effectively assessed the continuation of the improvement that was achieved.

Future research should examine the relationship between educational coaching practices and Palestinian Arab students' self-regulation among a more diverse study population in terms of religious background, socioeconomic status, and educational level. Moreover, future studies should examine the correlation between educational coaching and academic achievement and how educational coaching practices may relate to other components of self-regulation skills, such as metacognitive flexibility, self-efficacy, and motivation.

Author Contributions: Writing—original draft, T.S.; supervision, A.R.-G. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of the Educational Ministry of Israel and approved by the Institutional Ethics Committee of the Educational Sciences Department (code RO-10707) (05/2020).

Informed Consent Statement: Informed consent was obtained from all the subjects involved in the study.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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