

A Holistic View of Practicing Mathematics in the Israeli Educational System

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By

Yousef Methkal Abd Algani and Zehavit Gross

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"Our students are the mirror of our community. They make us who we are,
and they enable us to build a brighter future."

—Yousef Methkal Abd Algani and Zehavit Gross

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PREFACE

The act of providing instruction or educating another person is known as teaching. It is described as actual education that takes place in classrooms and offers students direction. One rule is to involve students in the learning process; hence, learning necessitates that students actively develop their skills. A teacher can and should be educated about the subject matter, the manner in which students learn, and the best ways to apply that knowledge. Now, the applicability and effectiveness of a teaching strategy may be evaluated in light of the kind of education it aims to produce and the results it achieves with students. The study of methods is continuing, and countless academic and psychological papers are currently filled with issues relating to various theoretical approaches and how they impact practices. Without seeing a classroom with students seated at desks and a teacher in front of them, it can be difficult to visualize learning or teaching. The course's material must give students a solid understanding of the pertinent point of view and participation style if they are to become self-improvement-oriented. The courses must give them the tools they need to understand what their practice includes from the standpoint of the discipline and to recognize its importance to other practitioners and the general public. Younger individuals should be able to analyze the benefits and drawbacks of various options, make educated decisions, and ask questions. They should also be able to assess the accuracy of the information and neutralize it.

They must also be able to participate in oral discussions and debates on a variety of subjects. To build, develop, and use digital education in times of peace, the lessons learned about online learning in times of crisis should be kept in mind for use in future crises. This necessitates a thorough understanding of higher education's online teaching and learning. Teaching is a way for teachers to spread their knowledge to the rest of society. It is the area that deals with organizing and giving lessons to students in academic settings. There is a lot of blending of traditional and contemporary teaching methods. In the current atmosphere, formal teaching methods like socialization are preferred over informal ones. The most practical way to impart knowledge to students and help them develop their morals, skills, values, self-awareness, convictions, and culture is to teach. The traditional method of education is also known as the conventional or usual education

technique. Traditional education is largely concerned with passing on essential social practices, as well as values, manners, and abilities, to the next generation in order for them to survive.

The expectation for students of the younger generation is that they will learn through study, experience, interaction, and cooperation, with an emphasis on their areas of interest. It is the duty of educators to design learning settings and methods that support a child's developmental needs. In order to implement skills, improve teaching, use publicly available research combined with theory and practice, achieve strengths and weaknesses, and have the ability to coordinate with coworkers to enrich the actions they perform, it is crucial to understand and learn about teachers' working styles as well as the teaching programmes that influence them. The application of professional knowledge and teachers' awareness, to varying degrees, results in all of these qualities, which may be found in the individual and situational domains of instructors. Regardless of the type of schooling, imparting knowledge is one of the most crucial elements of professionalism.

This book examines teaching strategies. As it enables both teachers and students to comprehend the teaching process, teaching and its many methods are explained. The book also briefly explains beginning teachers and their comprehension. Teaching obstacles to understanding the teaching approaches are included. Effective teaching strategies in higher education are described, along with their characteristics and barriers. Specific approaches to using instructional styles are described since they might be enhanced by enhancing student abilities. The book also provided a brief review of the various teaching and learning activities found in a complicated educational system. The effects of online instruction on professors in higher education and the use of technology will be demonstrated in the parts that follow. It also discussed the merits and downsides of using conventional teaching methods as opposed to modern ones. The discussion of Israeli perspective teachers' performance views, contextual elements, and instructional methodologies, as well as their academic training and comprehension in Israeli schools, marked the book's conclusion.

SUMMARY OF CONTEXT

After a brief review of Teaching and Teaching methods, the text covers topics as follows:

Chapter 1: The first chapter's introduction; categories of instructional strategies; many sorts of learning techniques; classroom teaching techniques; student-centered teaching strategies; evaluation of instructors; the variables that affect a teacher's performance in the classroom; the teaching method as a potential hub for international cooperation Israeli students' happiness with online education; teachers' professional development; teaching interaction style; inspiring instruction in policy and practice; encouraging the character of the teacher; efficient methods of instruction; various teaching techniques; summary.

Chapter 2: Introduction, Teachers and Teaching, Teaching and Curriculum, Beginning Teachers and Their Understanding, Teachers' Teaching Initiatives, Complexity in the Classroom; Teaching Thinking Skills and Assessments; Ethical Difficulties in Teaching; Teacher Knowledge of Students' Understanding; Difficulties in Teaching Those with Disabilities; Summary.

Chapter 3: Introduction; Israeli Higher Education; Israeli Student Law Rights; Neoliberal Era Perspective; Israeli Council for Higher Education: Structure, Goals, and Authority Challenges Facing Israel's Higher Education System; Function of Educators; Qualities of Instruction; The Evolution of Education Trends in Online Learning and Web Usage Using Technology in Education: A Need for Effective Teaching Techniques; Teaching Methods: Obstacles to the Adoption of New Teaching Techniques; Requirements for a Good Teaching Environment Among Professors; Standards for Faculty Members' Conduct and Performance in Effective Instruction; Establishing a Good Rapport with the Students; Summary.

Chapter 4: Introduction; Teaching Method; Teaching Collaboration Value and Skillset; Need for Skill Development; Personalized Learning to Develop Personality Skills; Individualized Instruction Using Learning Analytics; Skills Development Levels and the Value of Learning New Skills: A Summary.

Chapter 5: Introduction; how education systems create and develop high-quality teachers; educational goals and teaching methods; the role of teachers' beliefs in educational reform; Israel's shift to learning management; the effects of learning on a teacher's level of satisfaction; using a constructivist approach to schooling; using an inter-disciplinary curriculum; future revisions of the curriculum in a particular area as influenced by the curricular framework; establishing a learning standard; characteristics of the tactics used by students and teachers; difficulties with learning management in Israel's educational system; summary.

Chapter 6: Introduction and the Knowledge Revolution of the development of computer-based learning and technology, the integration of ICT, and the role of instructors in instruction; factors influencing the status of teachers in ICT integration; a background on computer-based learning; a shift in pedagogy towards ICT integration; a quick overview of computer-based education; Computer-Based Education Categories; the roles of the teachers in charge of science departments; training of computer science teachers worldwide; Israeli teachers in computer science; computer science education in Israel; ICT implementation and the role of the educator in ICT implementation; ICT-related attitudes of teachers; ICT-related teacher knowledge requirements; teacher preparation; personal and educational factors that affect the use of computer-based education; Israel Academic Colleges' Computerization: A National-Level Programme; summary.

Chapter 7: Introduction, online teaching methods and collaborations, the higher education system of Israel and its milestones; higher education as a forum for practice; instructional techniques involving technology; online learning environment; conversion of direct instruction to online instruction; factors favoring higher education online institutions; institutional infrastructure; technical support; commitment to digitalization; attitudes regarding the abrupt switch to online instruction; teachers in higher education who employ reasonably priced digital technology; aspirations for faculty in terms of online teaching transformation; reviews on the effectiveness of online instruction from students and faculty; practical obstacles to online education; study resources; summary.

Chapter 8: Introduction; Israeli education; traditional education; the applicability of contemporary instructional approaches; the transition away from recitation-focused memorization and towards the age of experimental encounters causing Israel's educational system difficulties in delivering modern education; the essential components of the Israeli educational system nowadays; comparing traditional and modern education; e-learning

overview; the justifications for using the modern teaching method; innovation as a concept; traits of contemporary teaching techniques; the incorporation of contemporary instructional techniques; devices utilized in contemporary education; contemporary teaching techniques; benefits of traditional education; drawbacks of traditional education; benefits and drawbacks of online education; sharing of information; the contrast between traditional and modern education; summary.

Chapter 9: Introduction; Israeli society and schools; Israeli official public schools; the educational system's curricula; the setting of the school, including the teachers and system operation; intra-school setting; teachers' awareness of their obligations to perform professionally; work habits and teacher expertise; Social Teaching Methodology; modern modifications to learning environments; barriers to teachers' education; a few ideas for teachers to consider; awareness of teachers' existence; processes of learning and characterization; characteristics and varieties of knowledge in education; the training of teachers; summary.

Chapter 10: Introduction, a contextual understanding of profession-based efficacy; student and teacher self-efficacy beliefs; differentiated instruction; Israeli teachers' perceptions of their own self-efficacy and differentiated instruction; differentiated instruction and implementation strategies; collaborative creative learning; small and flexible group instruction; student choices and learning; circles; Israeli school system inclusion and achievement contradictions; knowledge of teaching professionals; the origin of differentiated instruction; the efficacy of teachers; differential role perceptions of teachers; formative assessment; teacher professional learning; and differentiated instruction tiered problem-solving activities; current formative assessments and curricula; a summary of teachers' confidence and competence in Israel.

CHAPTER 1

TEACHING AND VARIOUS TYPES OF TEACHING METHODS

1.1. Introduction

Teaching is the act of instructing or educating other people. It is called "practical education" because it shows students how to do things in the classroom. It is also said that it involves working with students to help them understand and learn knowledge, ideas, and steps. It includes planning, deciding what to teach, distributing it, evaluating it, and figuring out what it all means. One way to teach is to get students interested in what they are learning. As a result, active skill development is part of education. A teacher should not only know about the subject but also about how kids learn and how to help them learn well. To teach better, teachers must be committed to making sure their students understand. The goal of teaching is to turn students from passive receivers of information into active creators of their own and other people's knowledge. Obviously, the teacher can't change unless the kids do something about it. Teaching is, at its core, about giving students social and moral situations in which, they can choose to take responsibility for their own learning, both as a group and as individuals.

Here is a full description of how training comes together:

- Teaching planning includes analyzing texts, setting goals, and writing objectives.
- The organization of teaching shows how to teach in order to reach the learning goals.
- Determining the right ways to teach and learn so that information can be communicated well
- Governing teaching and learning, which focuses on evaluating learning goals in terms of how well students do and giving teachers and students advice.

Education systems are the big ways that students are helped to reach their learning goals, and activities are the many ways that these systems are used. Students will gain from ways of teaching like mastering the course material and learning how to use it in different situations. Teachers have to decide which ways of teaching will help a certain learning goal the most. The effectiveness of the method depends on how well it fits with the learning goal. When making the best choice, a teacher should look at learning goals, student needs, and the learning environment.

1.2. Categories of teaching approaches

There are numerous different teaching methods, which can be categorized into the following four main groups.

1.2.1 Methods centered on the instructor/teacher

Teachers serve as educators and authoritative figures who instruct students through lectures and hands-on instruction, with the aim of gauging achievement through testing and evaluation. The teacher is perceived by the students as a knowledgeable or powerful individual. Both sides of the learning process view it as a passive process of taking in a lot of knowledge from the teacher.

1.2.2 Methods centered on the learner/students

Teachers still play a crucial role in the learning process, although they could work more as a facilitator or "advisor on the sides" as students participate more actively. In this method, students are continually graded on tasks like group projects and participation in class.

1.2.3 Methods centered on the content

The teacher and the students must be compatible with the topic covered by this collection of approaches. This implies that the knowledge and skills to be imparted are sacred or extremely important. In-depth analysis and high-quality content are given a lot of consideration. Nothing connected to the curriculum may be changed or criticized by the teacher or the students. An approach that places the instructor's and students' interests below the subject is the programmed teaching strategy.

1.2.4 Methods of interaction/participation

It borrows from the first three without placing too much emphasis on the student, the subject, or the teacher. These tactics are driven by a planning process that considers the circumstances of the students and the instructor to determine what is the most appropriate thing for everyone to learn or do at the moment. They demand a shared grasp of many topics and components.

1.3. Difference types of learning methods

1.3.1. Online learning

Prior to the Govt-19 outbreak, most professors didn't typically teach online, however some always choose to do so. But what does "online teaching" actually mean? In its most basic form, it is the practice of getting to know someone online through individual or group video chats, webinars, or messaging services. In order to keep students interested, a variety of factors are typically used.

1.3.2. Experiential learning

Because it promotes creativity, aids in error correction, fosters reflective thinking, and gets students ready for future experiences, experiential learning is a fantastic teaching strategy. It is beneficial for many academic fields, notably for math and science investigations. The simplest method to encourage learning in a classroom is for students to assess themselves, reflect frequently, and enhance what they have learned.

1.3.3. Game-based learning

A method that includes features is known as game-based learning. Students' motivation is increased when math is taught using this kind of learning. Kids are extremely interested in mathematics, so this might be a great place to start with anything from video games and smartphone apps to math learning.

1.3.4 Student-centered learning

The instructor should conduct classroom instruction and spend more time in charge of the class for teacher-centered learning to be most effective. With student-centered learning, students are more likely to decide what they

want to learn and how to study it. People frequently refer to this as personal learning. Through the use of student-centered learning strategies, instructors encourage participation from their students rather of assigning them to passive activities like reading or writing an essay. They will participate in numerous talks with their peers and teachers, and they will be urged to put forward inquiries about inquiry-based learning, where self-learners are created in the field of mathematics ("6 Effective Teaching Methods and How to Use Them" 2021).

1.4 Methods of Teaching in the Classroom

In the classroom setting, the instructor can impart knowledge and skills using a variety of instructional strategies. These fall into the following general categories:

- Instructional strategies that are focused on the teacher.
- Instructional strategies that are focused on the students.

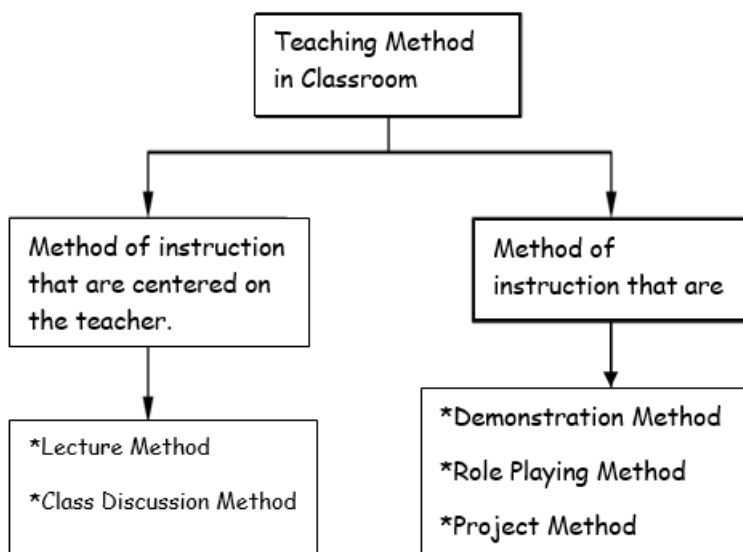


Figure 1.1 Various types of teaching methods in classroom

1.4.1 Methods of instruction that are centered on the teacher

1.4.1.1 Lecture Method

It's a method of instruction where the teacher tries to explain concepts, ideas, or relationships in a way that students can comprehend. The students are the audience; the instructor is the active participant. The instructor keeps on speaking with the students. The class takes notes on information and concepts to be remembered and considered before writing it down. In a lecture, it's customary for students to remain silent. Although certain questions may be asked by students to clarify a topic, there won't usually be any discussion.

1.4.1.2 Class Discussion Method

A discussion strategy is a method for reviewing various facts associated with the topic being discussed, explaining them by looking at how they are related, and making conclusions from the facts and relationships discovered. This tactic helps students develop their ability to accurately and efficiently express their ideas and facts by encouraging them to analyze cognitive processes, organize data, and assess data.

1.4.2 Methods of instruction that are centered on the students

1.4.2.1 Demonstration Method

The term "demonstration" describes a teaching strategy that uses displays and presentations. This entails assigning a group of students to keep an eye on certain equipment or a planned event. The key characteristics of each subject's content, as well as its applicability and efficiency, and information on each process stage. It comprises of both lectures and the instructor's individual study. The classroom's presenting area and classroom are used by the instructor to teach and demonstrate. Before, during, and after some demonstrations, part of the training will clarify the objectives, items used, fundamental concepts, and process results.

1.4.2.2 Role Play Method

Spontaneous performances have a part in creating social circumstances that are clearly defined by two or more people for later class discussions. A certain social setting helps one communicate their opinions and sentiments about that setting, as well as their perceptions of who they can trust, the reasons behind their actions, and what can be done to remedy problems

through group discussion. This method can therefore produce data on human behavior and interpersonal interactions, which is not achievable using conventional techniques.

1.4.2.3 Project Method

The curriculum's content is one of the most recent approaches to lesson design that is based on the child's needs and interests in the context of real-world circumstances. This means that extracurricular activities at school need to be closely related to the child's needs and daily routine. The well-known American philosopher and educator John Dewey is the source of this tactic's pragmatic educational philosophy. This philosophy places a strong emphasis on giving kids a wide range of rich experiences.

1.5 Assessment of teachers

The process of teacher evaluation identifies the various tasks, parameters, and components required for high job productivity in the educational system. The instructor claims that evaluation satisfies a number of goals, including quality assurance, professional development, and instructional motivation (Sergiovanni 2007). Open observations of the teacher's academic performance, grade completion, case studies, or assessment review are common evaluation methods for educators (Peterson 2004). Rating scores are another resource frequently utilized by head teachers to assess how well an instructor satisfies task requirements (Goldring et al., 2009). Based on input variables like correctness, equality, and dependability as well as behavioral elements like independence at work, capable coworker support, and concern for what happens in school as well as performance level, educators are identified (T. Kersten and Israel 2005).

1.6 Factors influencing teacher performance in the classroom

The subjectivity of the evaluator, the teachers' compliance with the principal's evaluation goals, the evaluator's level of expertise, the institutional environment present in the school, the level of hostility between the principal and teachers, and other factors all have an impact on how well a teacher performs in the classroom. However, differences in assessment quality (reliability, ability to accurately portray the instructor's qualities, behaviors, or products, etc.) are mostly influenced by the evaluator's characteristics. Additionally, it shows that the inherent hierarchical

disparities between organizations, which have an impact on the instructor's evaluator's perspective, provide a special challenge in the teacher's primary assessment (Gaziel, 2002).

1.7 Education system in Israel

The Israeli tradition has placed a strong emphasis on education and learning as obligations for a lifetime, a legacy that is still present today. The Israeli educational system seeks to provide all members of the community with education of a higher caliber while advancing democratic ideals. The evolution of Israel's educational system has gone through several stages since its founding. Massive immigration occurred throughout the 1950s, and the educational system had to meet the needs of a society that was expanding quickly despite significant constraints, such as a lack of schools, classrooms, and competent teachers. severe economic situation and parents with low levels of education. The population of primary school students was significantly altered by significant immigration; the proportion of disadvantaged students rose, necessitating a reform in the organization of the educational system. In order to better serve the needs of the underprivileged, the reform introduced many types within the educational framework and curricula. Each student received the chance to fully appreciate their capacity with the elimination of high school selection and the adoption of the idea of equal opportunity ("Education in Israel: An Introduction," 2016).

1.8 The issues of teaching force quantity and quality

Teacher shortage and teacher quality are two factors that can be used to analyses the historical development of the Israeli education system for instructors. When there is a teacher shortage, teacher availability is the primary issue; however, when demand and supply are balanced, teacher performance is the primary issue. Changes in teacher education are typically driven by public groups and are a consistent response, frequently concentrating on one issue at a time. As a result, many of the flaws cited by one group are frequently caused by changes made earlier by another group. Size issues were particularly prevalent in the early years of Israel's existence and during the height of mass migration (the 1950s, 1970s, and early 1990s). There was a general lack of instructors due to large relocations, particularly those who shared the same ethnic background as their international students.

1.9 The Teaching Approach as a Potential Platform for Global Collaborations

Online teaching methods have been used in numerous universities all around the world for decades. Juan and colleagues are looking into how this method might be applied in math and statistics classes at institutions across Europe. In addition to the United States, Europe, Africa, and Asia, online learning is also widely employed in higher education (Juan et al., 2011b). As a result, it is a global phenomenon capable of independently changing the characteristics of each country's higher education system while also enhancing communication across numerous research universities around the world. The availability of online courses for students from other nations and the conduct of online research that fosters the sharing of knowledge between researchers from other nations serve as examples of these interactions. It is dedicated to remove legislative obstacles to the local market's integration of international higher education, including by developing procedures for an accredited board for online courses or degrees.

1.10 The Effect of Online Education on Students satisfaction in Israel

Learning quality and student happiness have been impacted by Israel's unchecked and rapid growth of online education. The University of Tel Aviv performed a study to assess student attitudes towards the potential of online instruction, preliminary information on variations in improving distant learning, and hurdles noticed by students. According to the survey, students feel that online learning enables them to maintain their routines, change their schedule to meet their unique demands, and complete other daily duties while learning. Furthermore, because they can listen to lecture recordings whenever they are comfortable, students believe that online education encourages flexible study speeds. Students think that learning at home is advantageous since they may avoid going to school and save a lot of time and money.

Additionally, the switch to online education prevented the semester from being cancelled, which may have been particularly disruptive for their teachers and their students' lives. Students, on the other hand, made note of the limitations and difficulties brought on by converting to an online teaching methodology. It is alleged that this method of education degrades instruction, that some professors lack competence in it, that it is challenging to rectify, and that it creates obstacles that conceal technical flaws and

lecture continuity. They have demonstrated that when seeing a lecture online, students are less motivated to study and require assistance focusing (E. Cohen & Davidovitch, 2020a).

1.11 Initial teacher education and the institutions

1.11.1 Various approaches for beginning teacher education

The Department of Education Instructor of Colleges (formerly Teacher Seminars) and the School of Education within the universities provide primary teacher education. These two types of instruction are very different from one another in terms of organizational structure, training role models, and lesson plans.

1.11.2 Structure, curricula, and quantity of teachers in university teacher education

The Technion, HiFa, TAV, Bar-Ilan, Hebrew, Ben-Gurion, and Weizman Institute are the eight universities where teacher education is offered at the university. The teacher education programmed is run like a graduate programmed, and all applicants must have finished their undergraduate degrees. because the postgraduate science study includes the teaching credential course. The University of Haifa, for instance, offers a specific graduate degree in teaching in addition to the standard programmed for teaching certification. Students who graduated from universities with teaching degrees are qualified to instruct in junior high and high school courses.

1.12 Teachers professional development

The Ministry of Education and the Instructor's colleges started a long-term programmed to improve Israeli teacher quality in the early 1990s. These instructors can seek a degree in education at universities and colleges with academic accreditation. Since there weren't many candidates at first, there was no need for a special expense. However, due to a number of factors, such as universities' willingness to accept these undergraduates into their undergraduate programs and the chance for teachers to upgrade their certifications from certification to innovative certification when enrolling in undergraduate courses, for instance by expanding their knowledge of mathematics in higher-level thinking (five points), the number of applicants increased dramatically in a short period of time.

1.13 Teaching interaction strategy

Inquiry and assessment skills, critical and analytical thinking, and positive attitudes are all intended to help learners take proactive measures to safeguard, promote, and advocate for their own and others' health, well-being, and safety. In order to collaborate with others in active learning, identify their own strengths and abilities as well as those of their peers, and develop a variety of personal skills, including communication, bargaining, teamwork, leadership, and appreciation of different perspectives, educators use communication and social skills (Senthamarai, 2018).

1.13.1 Embracing teaching and learning methods

The methods used in relation to the learning activity are merely recommendations. Teachers can select multiple strategies or modify what is suggested to deliver the lesson because they are aware of the demands and learning preferences of their students.

1.13.2 Considering students learning approaches and needs

Although teachers recognize that students are unique, this does not mean that they should all be given personalized training or schedules. The organization, curriculum, and practices of the classroom all reflect the customization of learning and teaching. Teaching and learning methods can incorporate a variety of whole class, group, and individual activities that enable each student to participate in and succeed by adapting to diverse skills, abilities, learning rates, and learning styles.

1.13.3 Being inclusion of all students

If the required modifications to how they educate and express their learning are implemented, students with the majority of disabilities can attain academic levels comparable to those of their classmates. To guarantee that students with disabilities have equal access to, involvement in, and success as their peers, instructors can change the allocation of activities and approaches in this resource.

1.13.4. Promoting Values Education

When dealing with educational obstacles, particularly in mathematics, students need to reflect on their individual worldviews, moral principles,