

INNOVATIVE TEACHING METHOD: "INTEGRATION OF HYBRID LEARNING IN THE LEARNING PROCESS OF LEARNING MATHEMATICS"

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Abstract

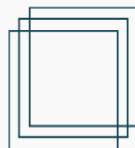
Does the term hybrid teaching of mathematics mean: "Integration of different learning modes into the learning process"? These learning modes are only: face-to-face sessions, synchronous sessions (ZOOM, Google Meet, WebEx ...) and asynchronous sessions (moodel , ted , YouTube ...)? Is there a significant benefit for the teacher, the student, the learning process and its mathematical products compared to single-channel learning?

The desire to relate the needs of hybrid mathematics education and to present a set of recommended steps for planning the hybrid learning process of a unit of study or a general annual mathematics curriculum was the main motivational vector of this article. These steps were formulated on the basis of the experience gained during the days of the pandemic and as part of the hybrid teaching of mathematics at the Eilat Gymnasium.

Keywords: planning a hybrid learning process, hybrid teaching of mathematics, hybrid teaching, a combination of several different teaching methods, innovative teaching methods.

Step 1. Determine the purpose and learning outcomes.

Let's start with the end product of teaching mathematics and divide it into four main levels: knowledge, skills, tools, and learner.



Knowledge: Ask yourself what will the student know at the end of the process, more than they know now? Why is it important that we have this information? We offered each student to collect information on a mathematical topic of interest to him and intrigue his peers. **Rationale:** Allow the student to dive deeper into the area of mathematics that interests them, and thus also allow the teacher to become more familiar with areas of interest that are of particular interest to students in mathematics.

Skills: Ask yourself what skills we would like to develop in students in the process of teaching mathematics? Survey, research, collaboration, critical thinking, creativity, flexibility, presentation of information, self-learning?

Tools: Ask yourself what application did the students come up with at the end of the process, what application tool are we giving them at the end of the learning process? We wanted to provide students with less familiar digital tools with which to submit a request. We called it a mathematical numerical query.

Offer students a range of different courses on various digital tools. Mathematical master classes are held on the day of distance learning for all students of the school. Each course has 25-30 students from the school present to familiarize themselves with this tool and submit a digital request with them.

Learner: The hybrid learning process of mathematics has given different learning configurations that allow learning from different aspects. So let the students reflect on themselves: what have they learned? How did they feel? What did they learn about their friends? What did they learn about themselves? This allows you to track the process of personal growth that has taken place over time.

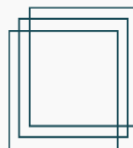
Step 2. Selecting suitable modes of teaching mathematics.

Choose those forms of education that suit you as teachers, your students, and learning outcomes mathematics that you have defined. Hybrid mathematics learning combines three main learning modes: face-to-face, synchronous, and asynchronous. We have found that synchronous meetings can be very effective in transferring knowledge; In-person sessions can be very effective for developing resilience, emotional skills, collaboration skills, and more, while asynchronous sessions can be effective for student self-awareness and skills for independent learning, exploration, critical thinking, and more .

When choosing modes, we have tried to eliminate the limitations of time and space, known and familiar to students. The more we allow ourselves, the more we realize the strengths of hybrid learning.

Step 3. Get involved in the process.

You define your presence in the learning process of mathematics. In face-to-face teaching, our presence as teachers is clear and definite. students know when and how to contact us. When adding synchronous learning, and especially in asynchronous learning, we need to identify ways and times to communicate with us to support and answer math questions. That is, remember that it is important that we are present



even when the student is faced with the process of learning mathematics in front of the screen.

Step 4: Create an infographic of learning milestones mathematics.

Give students an infographic that describes the stages of learning to the final product, integrated into the timetables. In hybrid learning, it is more difficult to see the steps in the process. That is, in order to understand how each session leads to the final product, it is worth showing the steps along this path and in each session in advance, representing the stage you are at.

Step 5. Variety of content options and teaching methods mathematics.

Offer students options for choosing the content and forms of teaching mathematics. A major factor in creating a connection between students and learning is the experience of choice. The hybrid teaching of mathematics gave us the opportunity to offer students options to choose from. Choose from a variety of learning strategies: reading an article, listening to an audio, an animated video... a strategy that suits them. We found that the more options we offered for content, mode, product... the more interest and motivation grew and we got exciting, deep and amazing results.

Step 6: Create math content for students.

Let students create content. The lesson, designed to create content based on personal views, promotes the expression of personal opinion in context and independent conclusions.

Step 7 Create a collaboration

Build collaboration between different factors and between you and the students. Cooperation between you and teachers of different levels of mathematics, between you and the school coordinator for the use of computer technology, between you and students. Agree with one of the students that in the synchronous meeting, he will lead the presentation, video, etc. This allows the teacher to focus on the content and students and not be stressed.

Step 8: Adapt Easily

Test your ability to quickly organize, recover, adapt and change. It is important to constantly keep our finger on the pulse and ask if we are on the right track for the math learning outcomes we have identified, and if the answer is no, lock in and recalculate the trajectory and set a new math goal.

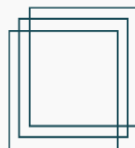
Step 9. Mutual trust

Trust yourself and your students.

Step 10 Set your focus.

Pay attention to what we focus on as teachers and educators. Each way of teaching mathematics requires us to have different teaching and learning skills.

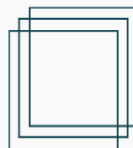
Combining several different ways of teaching mathematics: face-to-face, synchronous and asynchronous does it require that we plan and consider learning products, student needs and our preferences as teachers in order to implement them and optimize the benefits of hybrid mathematics teaching? Do we formulate the



process of teaching mathematics in accordance with these stages in order to conquer new mathematical peaks together with students?

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