"Changes in Israel's secondary technological education system as a result of three waves of the
Covid-19 pandemic (2019-2021) - a macro-approach to the topic."
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<u>Introduction and general structure of this article.</u> Methodological note.

The emergence of the Covid-19 ("corona virus") epidemic found the author at the stage of the end of his activities within the framework of the Israeli Ministry of Education. Nevertheless, the author continued his pedagogical activity in various frameworks of the Be'er Sheva municipality and in the scientific and pedagogical association (NGO) "Shaham"[10].

The source of my data was open resources of the ministries of education and health. Many articles have been written about the impact of the COVID-19 pandemic on the education system in general and on technology education in Israel - several of them by me [14]. They analyze the impact of the pandemic on the work and results of specific technology departments. But there were also impacts that either did not become obvious immediately or were transient. In this post I have focused on the macro aspects of this problem. Since the gradation of these problems has not yet been formed according to their degree of influence on the system, the order of their presentation is random.

The main aspects and directions of specific fields of the influence of the Covid-19 pandemic on the state and trends direction of development of technological secondary education in Israel, on the location of technological secondary education in Israel on the "ladder of social values".

1. The corona virus epidemic, starting from its first wave in 2019 and continuing as part of the pandemic in the 4-th wave of 2021, has radically affected the social status of technological secondary education [1, 3, 12].

Its status rose as this field - rightly or not - promised sustainable and well-paid employment.

For readers outside of Israel, this is the time to mention, that regardless of the rise in unemployment [9], the national income produced in the country has grown much higher than in comparable countries of OECD: by 3.83% on average over the last 5 years [3]. In order for young people to choose route of technology education on the eve of forwarding to high school, there was no need for them to look for the above data: they heard about it on the daily basis on radio broadcasts and saw numerous reports on national television. The choice of a further path for acquiring a specialty was also the most frequent topic in conversations around evening coffee near the family table during the periods of partial or complete isolation of the family - in order to stop the pandemic on the doorstep of your home.

2. Departments and specializations of "high technologies" as "an engine" of technological secondary education during the pandemic.

Not all of the various technology departments have been equally attractive. In the first place in terms of attractiveness came those technological departments, whose graduates found or hoped to find jobs in the existing and future labor market more easily: programming, electronics, computerized accounting, scientific organization of industry, architecture and similar topics. All those departments, where study was associated with the acquisition of experience in a real industrial

environment, which was temporarily closed to one degree or another, fell into the second place in terms of their attractiveness for the future generation of acquirers of technological education. The first place was taken by all those specializations, where parents and older sisters and brothers continued working   during the period of isolation - but from home office, on the basis of a computerized connection. This trend is reflected in publications on the relevant topics [14].

   In the absence of opportunities to urgently develop
new pedagogical technologies, it is possible and necessary to
turn to those that are not used for one reason or another. Back in the 80s, I developed a specialized collection of problems in electrical engineering, in which problems were solved using a computer. This collection of problems was adopted as a mandatory teaching aid for the relevant departments and went through 3 editions. Some of these tasks even appeared as questions on exam tickets [4]. Unfortunately, this initiative of mine was not implemented in other technology departments.

   But it became clear, that computerized problem-solving attracted students with its novelty. Now, when at least part of the educational process is carried out outside the school, it is necessary to mobilize this computerized approach to solving problems in order to deepen the study of the material during the periods of isolation in a larger number of technological departments [5, 8].

3. Departments of technological secondary education as a testing field for new pedagogical technologies.

   As always throughout history, emerging obstacles and problems lead to the search and findings of new solutions. With the onset of the "pandemic", it became obvious, that the old teaching and learning methods must urgently be changed.

   Developing of the new ones is a long and painful process, that the existing conditions left no time for. The solution will be in search for changes in existing training processes both in our country and abroad [11]. In addition to the already mentioned in the previous paragraph an engaging approach to solving problems - an approach that can be adapted by students of different cognitive abilities, it is worth referring to pedagogical technology, which I acquainted when preparing for my doctorate. I visited the technological departments of the periphery (thanks the government of Canada, who paid for this trip) and collected material about the technological education in remote and sparsely populated areas of Canada. To expand my knowledge in this area, I used the professional literature about Northern America [2], which helped me to expand my knowledge in this field. I also interviewed educators in the field of technological education in these areas [13]. A hallmark of technology education in remote areas of Canada is focused mainly on local indigenous population. The "weak point" of these student`s studies is their limited knowledge of the English language, that they but little use in everyday life. In order to address this problem a specialized organization of educational material was chosen: reducing its textual component and creating a schematic (visual) stepwise presentation of the material – which is more understandable to students on the periphery. In our reality, this approach can become one of the preferred learning technologies regarding national minorities in Israel and newcomers to the country in order to deepen their social mobility [6. 7]

4. Development of new technology departments and specializations as an extension of choice for future students of technology education in conditions of long-term restrictions at the pandemic period.

   In recent decades, the list of technological branches an specializations has stabilized and only specialization in cyber area stands out as "innovation". The traditional creation of new departments was based on their emergence as something different from the existing trends and included the mobilization of specialists from

these departments, the preparation of new curricula and manuals, developing teaching aids for teachers, a "bank of examination questions", etc. Historically, such a process has proved to take many years. The "pandemic" situation is clearly not conductive to accelerating this process. The "engine" of the accelerated process of creating new and attractive specializations can only be an "external" factor: the urgent need for specialists in a new specialization in industry, a special and obvious interest of students in new specializations [11]. I personally have experience in attempts to create such specializations with the participation of "interested partners".

One of the attempts was the initiative to create a specialization "Lighting and sound in the performing arts" with the participation of the professional magazine of the stage workers. Another - which also did not come to "maturity" - was an attempt to create a specialization "Editing and Translation", within which graduates were to study computer translation and editing of texts and foreign languages in an expanded and in-depth volume: Arabic, Persian, Russian, Spanish and ... etc.

Today, political processes are changing the position of our country in its geographical space and can bring the development of such new specializations closer.

5. Conclusion:

Changes in technology education systems in Israel and elsewhere as a consequence of the "pandemic" provide a convenient platform for transforming the education system into a more dynamic and relevant one for students and organizations.

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