



Rotary Hands across Water phase-III GG2099026 Final Report, Sep 6th 2021

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1. Executive Summary

Two school years spanning 2019-20 and 2020-21 ended on March **2021 Int'l Water Day** in a virtual yearend event. Following is a Rotary **Hands Across Water (RHAW)** report, on two years of growing activity sponsored in part by the **3rd RHAW Global Grant GG2099026**. **The water & sanitation Inspired cross cultural STEAM education program** was joined in 2020-21 by **15 twinning schools** from around the world collaborating with **35 schools** in Israel following **PRI Barry Rassin** call **"To take the RHAW program to the world."**

The activity was led by the district 2490 Water & Sanitation committee chaired by **PDG and WASH Ambassador Avner Fuchs** and the Haifa Host RC led by **VP Natan Feldman**. Forty (40) Rotary Clubs and Districts, from Israel and the world supported the program including PRI Knaack following a brief presentation during the Hamburg convention and in Dubrovnik. The **\$133.4 K GG2099026**, was drafted in 2nd half of 2019 was finalized in Q2 2020 and submitted on May 5th, 2020 and approved on July 10th. Collecting the committed donations lasted into Q1 2021 (Jan 6th) due to the long list of partners and the COVID-19 pandemic. It forced launching of the school year activity (June 2020) before the grant funds became available using intermediate funding provided by Hi-Teach.

In **2019-20, 53 schools** joined the program, (**2,200** students), 44 of which participated in a virtual graduation improvised in March 2020 to overcome the pandemic ban on large gatherings. It was successful and well received with national awards winning projects (Stockholm water prize, National science fair). The virtual event paved the way to the following school year with virtual activity proficiency. In **2020-21, 50 schools** joined (35 Israeli and 15 Int'l, some with multiple classes), totaling **57 classes** with **1750** students plus Haifa informal education 250 students, total **2,000 20-21 students**. Namely **4,200 students in the two-year grant period**. The 2021 virtual yearend event hosted **375 Int'l participants**, (Recorded on www.hi-teach.com) from Jewish, Muslim, Christians, Religious & Secular sectors, reflecting the cross-cultural collaborative nature of the program.

Four (4) teacher training courses were run (frontal & OJT), in Hebrew and English. **Teacher Training becomes a corner stone of the program**, appreciated by teachers, and Ministry of Education. Four (4) new, highly qualified coaches were recruited and trained. And a joint student visit to WATEC exhibition provided another opportunity to bridge across sectors, as did the informal education by the Haifa RC reported in detail in section 25.

The program was adopted to the Corona constrains; virtual tours substituted physical water site visits. A new Corona related content chapter was added. It addresses scientific and hygiene aspects including monitoring of community viral spread through sewage antibodies test. The program was adapted to pandemic school routine with teaching over Zoom and home-based STEAM experiments, 30 new chapter and advanced Lego modeling concept.

The Rotary clubs in Romania, Poland, Lithuania, Kosovo, Albania, USA, Israel, and India involved in the program and twinning pilot, expressed satisfaction and desire to expand the reach. We hope is to arrange enough financial support to allow us to meet the challenge, together with the partnering water utilities around the world.

Program manager,
Amnon Shefi

2. Schools

Interaction in 2020-21 was held with 55 schools of which **50 eventually did participate in the program**, including performance of a STEAM projects, presenting in the yearend event, and collaborating with other schools. 35 came from district 2490 (israel) and 15 from the overseas Twinning Schools

Most of the schools operated one class, one school in Haifa (Hareali) run the program with five (5) classes, and a few schools operated 2-3 classes. Overall, we had **56 active classes** in 2020-21 averaging 32 students per class totaling over **1750 students** during the school year. Teachers from two additional schools joined the teacher training and used the program content with their 50 students without formal registering. Recorded summary calls were held with ALL schools (All the teachers and most school masters!). A formal feedback survey was also conducted using unidentified **google forms**. The result indicates good satisfaction with the program. Recorded recruitment calls for the coming 2021-22 school year held during May – July of 2021, provide a good starting point for next year, with a possible early start, somewhat better than previous years.

In 2019-20, 54 schools took part in district 2490, with one exploratory connection held with a school in the USA (DKJA in Florida).

In 2020-21 the Corona year, of the schools in Israel 64% were secular 24% were Arab (Muslims and Christians) 6% were religious schools while the rest were secular. 6% were from special education schools. Five (5) schools (namely 10%) were gender specific, (Boys or Girls) and the rest were mixed gender. Age group were mostly middle schools (7-9th grade), with only few elementary & high schools.

The overall school reach (54+50=104 during the reporting period) thus exceeded the program expectations and set goals, despite the Corona virus limitation! It is followed by growing interest to expand the program participation. This is an indication that the program successfully addresses a real community need.

The overseas Twinning Schools were all selected and approached by the local twinning Rotary clubs. The clubs represent the community interest, focal areas, genuine needs, and connection to the schools, some of which they have worked with in the past. A typical Rotary community involvement role.

2020-21 RHAW Twinning Pilot Schools					
Romania	Poland	Lithuania	Albania	Kosovo	USA
EuroEd College Iasi	Specjalny Ośrodek Szkolno-Wychowawczy	Švenčionių r. Pabradės Žeimenos gimnazija	Ismail Qemali	Shkolla e Gjelbr	DKJA Donna Klein- FL
Emanuil Gojdu Clg. Oradea	Liceum Ogólnokształcące Niepubliczne	Gimnazjum im. J. Śniadeckiego	Qemal Stafa	Mileniumi i Tretë	
Ecaterina Teodoroiu College Targu Jiu	Obrowo primary				
Tudor Vladimirescu College Targu Jiu	Szkoła Podstawowa				

Twinning School Table (Condensed) for a blown-up version see Tables chapter 21



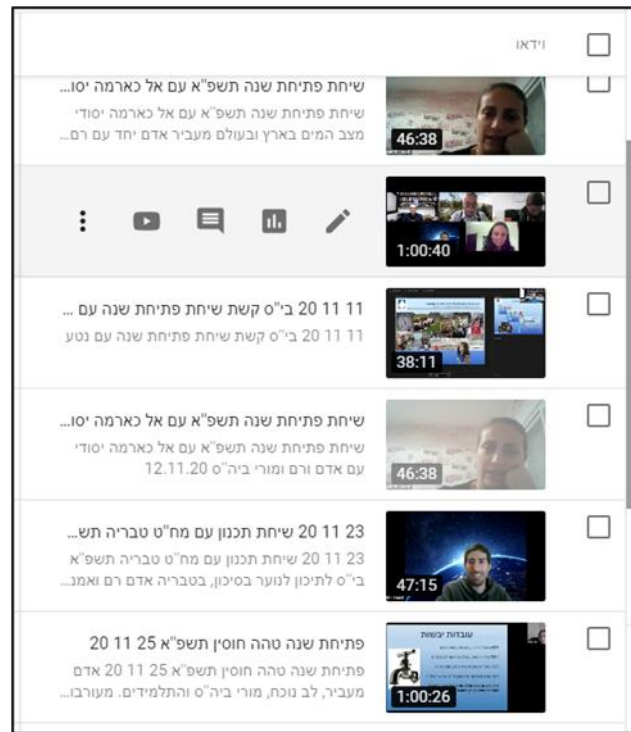
Schol Name	Town
Surkis	Kfar Saba
Ytuvaly Habsor	Eshkol
Nitzani Eshkol	Eshkol
Regavim	Beer Tuvia
Rimonim	Ashdod
Hahita	Zichron Yaacov
Nili	Zichron Yaacov
HaHoresh	Zichron Yaacov
Furadis	Furadis
Darcha Begin	Gedera
Ziler	Beer Sheva
Beit Ariel	Beer Sheva
Alliance	Haifa
Snt. Michael	Jaffa
A Tur	Jerusalem
Mekif D	Ashkelon
Mekif A	Ashkelon
Mekif V	Ashkelon
Ort Afridar	Ashkelon
El Karma	Haifa
Ahmadia	Haifa
Ironi G	Haifa
Hareali Matos	Haifa
Camal Eben Amdur	Sachnin
El Chilan	Sachnin
Tahha	Sachnin
Shaeb	Shaeb
Um Tuba, Boys	E Jerusalem
Um Tuba Girls	E Jerusalem
Arie Meir	Kiryat Gat
Ibrahim Iben Husain Mekif G	Shfaram
Gifted	Herz elia
Keshet	Mazkeret Batya
Rabin BW	Mazkeret batiya
Hamoshava	Zichron Yaacovb
Yoana Jabutinski	Beer Yaacov
Yeshiva HS	Zichron Yaacov
Pelech	Zichron Yaacov
Haklai	Pardes Hana
Gvanim	Eylat
Rabin	Eylat
GoldWater	Eylat
Shoham HS	Shoham
Ort Oranit	Oranit
Beit Ekstien	Petach Tikva
Abdalla Ben Husain	Shik Jarach, EJerusalem
Tsur Baher	E Jerusalem
Shareit	Kfar saba
Rabin	Kfar Saba
Eytan	Kibuts Naan
Beit Miller	Haifa
Amit, Ironi 6	Haifa
Bosmat	Haifa
Ein Hayam	Haifa
Matach	Tveria (Tayberries)

1School Map (condensed) for a blown-up exploded version see chapter 19 - Tables

A total of 4,200 students and close to 100 teachers benefited from the program in the two-year period. A larger more readable school table is attached in Section 22: Tables

Zoom. The interaction with the Rotary clubs as well as later with the schools was handled over Zoom. Hi-Teach supported the process thus also helping the Clubs overcome the technical challenges as well as the associated communication culture. Starting from keeping proper lighting, internet connection and good quality microphone, speakers and camera, and continuing with use of background slides, and keeping a “Zoom Room” in order, or avoiding motion of cell phone camera. These minor practices are what makes the difference between successful use of the communication tool and total failure and disappointment, and eventually inability to work from a distance.

Although not a declared purpose of the program, the need to collaborate overseas motivated the Rotarians to cooperate, and the experience gained by the Hi-Teach team in schoolwork and mostly in the virtual 2019-20 yearend graduation (See chapter 10 on graduation events) enabled us to support and improve the abilities of the 38 participating clubs. A side benefit for all.



Recorded Zoom Lessons Playlist

Guidance, Progress monitoring and STEAM coaching calls were held with the Twinning Schools following a well-planned out program. The calls with local and overseas schools were run and recorded and were made available to teachers and Rotarians who could not attend. This arrangement did save on travel and time for the local schools and provided more flexibility for teachers who could catching up later. The recorded calls which also provide a base for later analysis. (See link to the [recorded playlist](#).) With time the practice was polished to become very efficient in the use of time. Background material was distributed before the call and as summary mail was distributed after each call, with the call recording, action items, a date for the next call and an updated plan. A strict yet friendly, professional routine which was demanding for Hi-Teach to manage but highly appreciated by all the schools water utilities and Rotary partners. The zoom calls also included an elaborate demonstration of some of the STEAM experimentations. While short of actual in class demo, the online live demonstration did provide a viable substitute and allowed the classes to experience ‘Special’ lessons, such as “Energy in the use of water pumps” etc.

School recruitment and involvement was impressive considering the challenges imposed by the pandemic routine and the resultant student and teacher “Zoom Fatigue”. This is attributed to the relevance of the content, the virtual tours, and the practical STEAM offering and demonstration schemes, since a lot of the new content was created the summer of 2020, we were well prepared for the new year. Hi-Teach quick response time to growing knowledge, an inherent Hi-Teach strength proved critical again.

In school and at home activity. Although the Corona pandemic did constrain and limit in school activity and dictated sever social distancing, namely learning in “Isolation Capsules”, we did manage to integrate some activity during the limited in school hours. Those classes were used to guide student for self-study work including STEAM research. The pictures to the right show exceling elementary students at **Sorakis elementary in Kfar Saba**, prepare, in school, for a “Planting and growth monitoring” research project. The students proceeded

to conduct the research individually at home with Zoom guidance provided by Hi-Teach coach **Karam Nuriel** and science teacher **Dalia Katz**. A new way of learning. **The picture** shows students, school master and science teacher praise the program at a yearend celebration with **Kfar Saba Rotary Club** members led by **Tovi Herpe**



Teacher Dalia Katz and students at Sorakis Kraf Saba prepare for home experimentation



Rotarians from Kfar Saba Rotary celebrating at year end with Hi-Teach students and school faculty

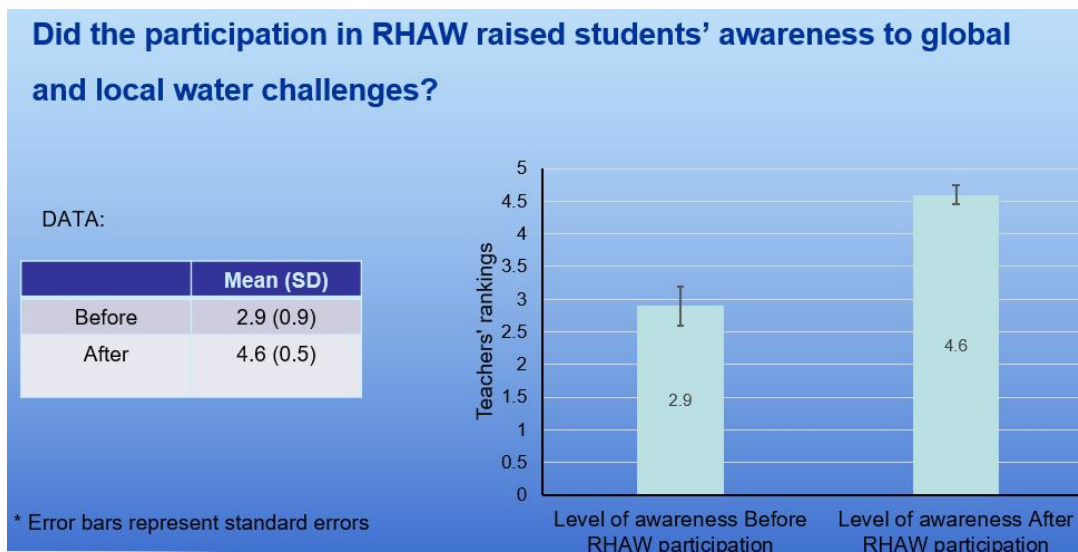
3. Satisfaction and Impact

Satisfaction and Impact of the RHAW program was assessed twice at year end of both school years 2020, and 2021. The general 2021 feedback reflected high level of school AND student satisfaction. Teachers indicated their strong interest in the program as well as a sense of self development for them as students. They also reflected strong student interest and a good impact on awareness.

Assessing the long-term impact of the RHAW program on student life and choices, is challenging since middle school students go through a long period of high school, military service, higher education, before they commit to a carrier, around ten (10) year period before they commit to a carrier, at which point they are hard to reach. However, exploratory study of past years graduates yielded the following results:

Out of the class of 70 middle school graduates of 2000, almost half (**47%**) **study or already practiced science**, (all with B.Sc. many M.Sc. and a few Ph.D.). Most of them reflect upon their Hi-Teach courses as a defining experience. See testimonials on www.hi-teach.com Typical quotes include: “It was not only positive and enjoyable experience, which is more than most children can say about their time in middle school, it also had impacted my life greatly” or “ ..It was one of my most significant learning experiences, first time I was given autonomy over my own learning...”

Teacher’s feedback. Teacher Training formal seminars and OJT are also monitored with formal feedback review by Hi-Teach and the Ministry of Education. The general feedback is very positive, including the Int’l education executive training of the three visiting international education executives (three groups of around 30 visiting executives each), as well as the Twinning Schools teachers at the end of the pilot year. The feedback relates to the value to the training for the teachers relative to STEAM’ PBL and modern teaching approaches, as well as to the teacher’s assessment of the RHAW value and impact on their students.



Feedback Pole: impact on Water Challenge Awareness

4. New STEAM content & activity

A long list of new content modules was developed including Hydroponics, Ecology and Overall ecological footprint including recycling (Water, Paper, Plastic, etc.), Energy and Water, Green energy and Energy storage, Water pumping, Irrigation, and modern and urban agriculture and more.

Hydroponics and Urban agriculture received a lot of attention with classes working the subject both in school and **at home**. An active WhatsApp teacher and coaches, community was established. Along with Hydroponics, the group research the impact of irrigation with reclaimed wastewater on produce, soil, and the dripper irrigators. The relatively new subject is constantly evolving and was extended this year to also relate to other environmentally related subjects like Industrial (refineries) wastewater treatment, Plastic recycling, and the protection of the sea as well as the study of the Sea-land interface along the shoreline.



Hi-Teach tries to keep up with the latest development of this broad field working with leading scientist (Like program partners **Prof Benny Chefetz** of the dean of the Agriculture & Food faculty of the Hebrew University and **Prof. Alex Furman** Head of the Technion GWRI). We keep up with their research and prepare UpToDate content and devise relevant experimentation and laboratories visits.

A large-scale demonstration research hydroponic system was developed by Hi-Teach at **Beit Miller** youth house operated by the Haifa program host RC. It was developed as part of a training course for a mixed group of high school students including a computerized monitoring system. It will be used jointly with the community.



A mixed student group develop the computerized system with Hi-Teach coach Dvir Aharon. Top: A comprehensive double system at Miler



Community members being trained by Hi-Teach on use of the Hydroponic system at Beit Miller

Hydroponic systems were also built and researched in **Branko-Wise in Beer Sheba** coached by Hi-Teach Dr. Amir Barnea and supported by the local Rotary club. The unique school serves youth of special challenging social background. Students managed to implement the project with very worm Students, teachers, and Rotary involvement. It included an emotionally moving collaboration with a similar school in Poland supported by the Lodz Rotary club.



Branko Wise Beit Ariel school in Beer Sheva with teacher Ariela and produce of the school Hydroponic system



Beer Sheba RC president Yael Peleg and water trustee and member of the W&S committee **PP Aharon Katz** led the program, and **Ariela Lebel** the experienced class science teacher commented after the Twinning collaboration session “I had tears in my eyes, thinking of the impact the program has on my students. The most exciting experience I had as a teacher in 40 years”. **PDG Prof. Marian Korczynski** from the Poland Lodz RC that sponsors the participating Polish school, called the collaboration and yearend event “**Superb**”.

Similar impression came from the Arab schools in the **Galilee and Jerusalem**. As well as the **Jewish school like Sorakis** elementary school in **Kfar Saba**, where the participating Rotary Clubs were very involved and helpful.



Hydroponics seems to capture a lot of attention across schools in Israel and abroad (**Twinning DKJA middle school in Boka Raton FL USA**). Those systems allow broad array of research at various levels suitable for elementary, middle, and high school. School master Hellen and science teacher Victoria and Coordinator Sammy were very involved in the twinning effort



Aquaponics was also the focus subject of a school in **Mazkeret Batya (Keshet and Rabin high schools)** where **Nir Zaitan** of the local RC the local Rotary club supported by **president Einat Malovni** that has been active in the program has installed a comprehensive Aquaponic system, complete with aquarium filtration system and Aquaponic growth. The chemistry of the system served as a base for the applicable STEM guided by our new coaches **Karam Nuriel** who specializes in modern agriculture education, and **Dr. Amir Barnea** who leads the activity in the south of the country.

Mazkeret Batia Aquaponic system, donated by the local Rotary Club

The impact of industrial water pollution and use of reclaimed wastewater on the soil and produce was a subject of continued investigation, in 2021 by the exceling school of Shaeb in the Galilee. The Shaeb middle school is an almost 10 years partner of RHAW. They work almost entirely independently landing a healing hand to new schools teachers and Hi-Teach coaches.



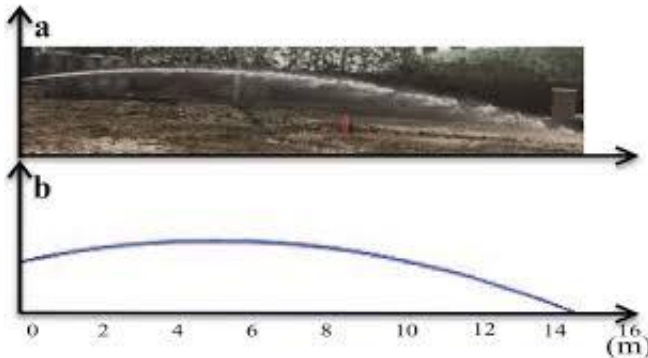
Shaeb middle school student and teacher examine soil and produce irrigated with reclaimed wastewater



Sheikh Jarrah students compare pressure compensated to non-compensated drippers

Drippers are crucial for modern irrigation. The technology allows effective use of water, delivered exactly where needed, when needed and at the right quantity. Drippers are however, far from simple plastic hoses with holes. A good example is the need to compensate for varying pressures when drippers are used on hilly slopes. Pressure compensated drippers, use miniature plastic silicone pressure compensating dripping valves. Advanced drippers were the subject of intensive research by students of all sectors. They examined the direct water flow from the various dippers under different conditions, as well as the growth impact the drippers had when used with different watering conditions and different types of water (Simulated reclaimed wastewater, drinking water, distilled water etc.) Drippers for the research were provided by the **NanDanJain and Mezer dripper companies**.

Water pumping and the associated energy consumption is an area of more content including pump models and analytical measurements. The activity includes reconstruction, model building and mechanical quantitative analysis of well and pump function and the analysis.



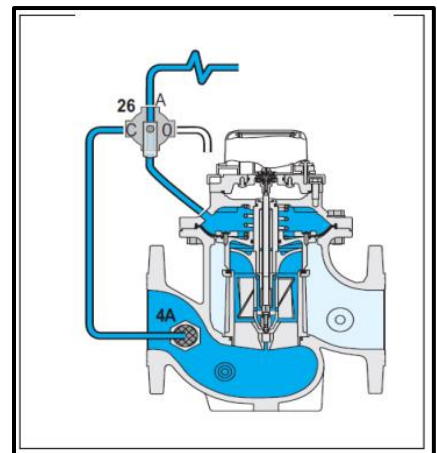
Water trajectory physics analyzed with Newton laws of motion (Above left),

Water pump robot built by Kaukab students (above right)

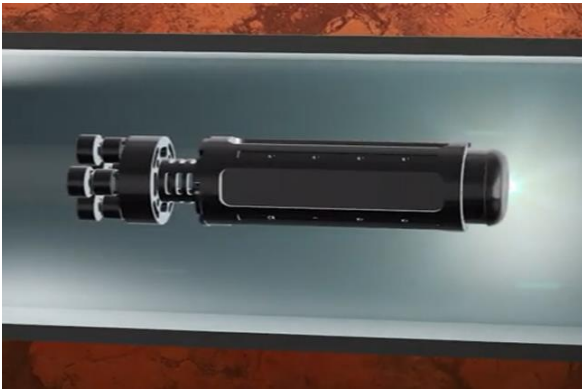
Students visit Firefighting water guns at Bazan (below)



Leakage prevention technology, starting from water pipes technology (**Plasson**) and pipe mending technology. Leak detection and localization by **Aquarius Spectrum** and leak reduction by automatic pressure regulation using **Bermad hydraulic** valves (Left). Internal pipe monitoring using “in pipe Submarine” by **Ipipe**. (All shown on this and next page)



Schematic of a Bermad Hydraulic Leak prevention valve



Array of leakage detection and prevention means demonstrated at WATEC 2019

Polymers, used in modern water devices from pipes, connectors and valves to drippers, greenhouses, and bathrooms. The subject was therefore added to the program content following teaming with polymer makers from raw material (Bazan Group Carmel Olefins) to Polymer Piping giant (**PLASSON**), Dripper (Metzer and NaanDanJain) and equipment makers (like Bermad Hydraulic Valves).

The energy required to handle water was added as a main subject including energy resources and use from ancient to modern times, from a camel to Combine Cycle Gas-Steam (**CCGS**) and renewable power generation today. This includes Heat, Electricity and High Voltage electric power transmission.



Water treatment hall at the Ashkelon Dorad Electric Power Plant

Water in the human body continued to serve as a reference curricular content base, adding the **Kidney** and the **digestion system as well as water use and balance**, the planned expansion on the **blood (fluid flow) system**, was substituted with a new unit on the Corona virus which addressed the biological aspects (Viruses, Genetics, Mutations, Infectiousness, Breathing impact and simulation, Immune system, vaccination, and the history of pandemics including Hygiene and its history). It naturally also includes mathematics (Exponential infection, Infectious factor R and the associated mathematics and simulation models) The development of this new unit was a quick reaction to the Covid 19 challenge which was very well received and used this year. A typical RHAW quick reaction to a knowledge challenge. The new chapter also included recommended school yard simulation games, (which turned out to be less useful as schools were closing). However, our repose to the need to work over zoom was quick and effective and it also served the Int'l Twinning Schools.

Water is a multi-disciplinary subject with relevance to the Environment, Economy, History, Geography, Culture and Religious, Politics and International Relationships. These aspects in addition to the Science (Physics, Chemistry, Biology), Engineering, Technology and Mathematics, make a huge STEAM base which Hi-Teach has been constantly and innovatively developed. The size of the program content base grew to include over 250 chapters, with approximately 350 presentations most of which include research tasks.

Content was also generated on the national water management and expanded to a global view which turned out to be relevant for the school twinning program, this effort will continue.

Use of **video** (especially virtual reality **VR 360** video) continued as **MOOC** (Massive Online Open Course) gains favored as a learning media with ministries of education. Intensive us of existing and our original video clips of our activity is used along with available YouTube clips.

Search to locate the content has become overwhelming for the teachers and Hi-Teach coaches now help teachers find the relevant content pieces. A set of searchable lists was developed for that purpose during the reporting period which will be expanded further. The **Knowledge growth** challenge is what Hi-Teach aims to address applying our 22 years of creative, innovative experience. we plan to rely on professional Moodle programming help to build effective knowledge maps and search tools compatible with the Moodle learning management system which was recently upgraded as planned.

Content Hosting web site was upgraded offline to the latest Moodle version. This is an important achievement we next plan to move over to **Linux operating system** base and consider new hosting options. We also upgraded our **internet web site, but this effort will continue as we prepare the site to the evolving School Twinning Operation** which requires automation of the registration which we plan to design next year.

Translation of content to Arabic was limited during the reporting and it needs to be expedited. However. The key chapters translated to **English** and used to train a twinning school pilot was further translated to Romanian and will be translated to more languages.

Introduction content for the Twinning Schools

The launching content for the Twinning School Pilot included an overall introduction and outline of the entire program, and a set of seven (7) detailed presentations (See chapter 8 The School Twinning Pilot). They aim to cover the overall background of the water & sanitation challenge, and solution used in Israel. The presentations were set to serve as examples and trigger ideas relevant for the Twinning Schools local areas. They also include exemplary proposals for associated STEAM activities and emphasize the relevance to various science curricula. The packages include Wastewater reclamation, Seawater Desalination, Smart Irrigation, Leakage prevention, Water savings, Water systems management and regulation.

Israeli Water Innovation




Reclamation
Desalination
Effective irrigation
Leak prevention





Broad applications
Proper management

Education
 A dialog with the future



Rotary Hands Across Water

A presentation overview of measures taken to address the water challenge

Desalination plants in Israel



Desalination plant - Ashkelon



Desalination plant - Ashdod



Desalination plant - Hadera



Desalination plant - Palmachim



Desalination plant - Eilat



Desalination plant - Sorek



Rotary Hands Across Water

Samples of content in English

Virtual Tours

Actual student visits to the water installations (like Desalination, Wastewater Reclamation, or water pumping stations) stop due to the Corona, we devised an internet-based alternative using Virtual Reality (VR360) photography equipment like **Kodak PixPro** camera and associated processing software.



PixPro Kodak VR360 camera used for virtual tours

The idea to use the new technique came from our experienced Jerusalem coach Batool Salman and it allowed us to maintain student interaction with the content which can be viewed at any angle, controlled by the viewer using the mouse or turning the viewing smart phone around. The technology broadly used in gaming was attractive to students and teacher and helped bridge the lack of physical visits, It has some real advantage in that the transportation (buss) cost is saved, Less time is spent' coordination challenges are eliminated' tour safety issues are resolved and since cost and time are saved – more than one visit can be done by the classes. An important extra benefit is the fact that now we can take our twinning schools on these virtual visit tours as well. Thus, it turned out to be a good new development which we will maintain going forward, in addition to the physical visits when those can be renewed



[A link to a virtual tour of the Ashkelon desalination station](#)

A similar virtual tour was shot at the Living Green Urban Garden on the roof top of the big **Dizengoff Center** shopping mall in Tel-Aviv. Another one was shot at an ultra-modern energy efficient wastewater reclamation station of Maayan Zvi near Zichron Yaacov, a town where ALL schools take part in the program. More shots were taken at Bermad and in the combined cycle power station (where most of the technology is water treatment and steam handling) it will continue to eventually cover all of our partnering water and energy



Students at the Tel-Aviv Dizengoff urban agriculture ranch

Hi-Teach

דוראד אנרגיה
תוכנית למתפלג וירטואלי

Elit-Ashdod Pipeline Company

EZOM
OPERATION & MAINTENANCE

מבוא לסיור וירטואלי בתחנה

26.12.20 Hi-Teach

Virtual Tour at the combined cycle power plant.

5. STEAM activity kit

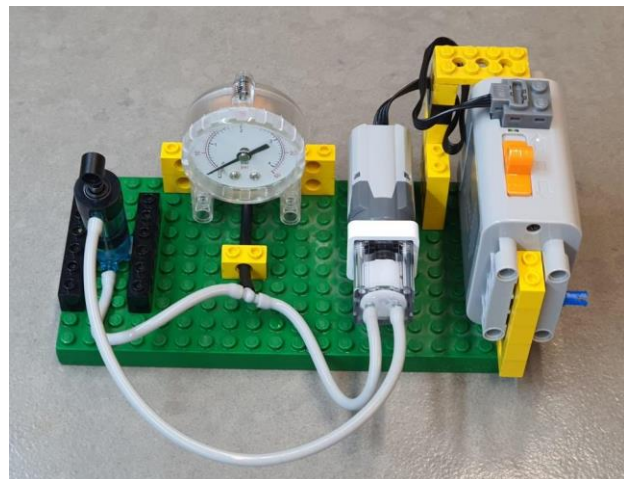
To support the STEAM activity, we practice an educational equipment package configured to be offered to allow schools to easily exercise the experimentation.

The multi-disciplinary water & sanitation inspired STEAM (Science, technology, Engineering, Art, Math) program was extended with a kit of **Hands-on STEAM** modeling using **LEGO Education**® kits (EV3, Energy Recovery, Pneumatic set, Power Function set and more), **Neulog dataloggers**, (A product of SES Scientific Education System, a long time program partner) and demonstration **Water Equipment Components**, like pumps, filters, piping, valves and drippers assembled into a STEAM kit and augmented with a long list of recommended practical experiments. The kit called **Hi-Teach STEAM kit** will be offered in a few levels of packaging in a mobile cart will allow schools to practice advanced STEAM experimentation along with the associated process, providing the required simple building blocks and instructions.

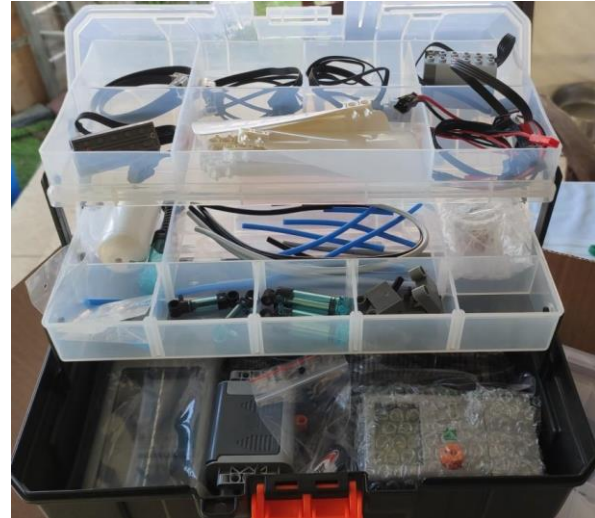


Components of the STEAM Kit

The subject of water pumping including a detailed analysis of the Water/Energy nexus was addressed in detail including live demonstration of small and safe electric water pumps. It serves as a base for physics studies (Newton's laws of motion) and forms a current relevant STEAM, with curricular value on one hand and environmental and sustainability relevance on the other. This characteristic of the RHAW is unique and highly appreciated by the schools.

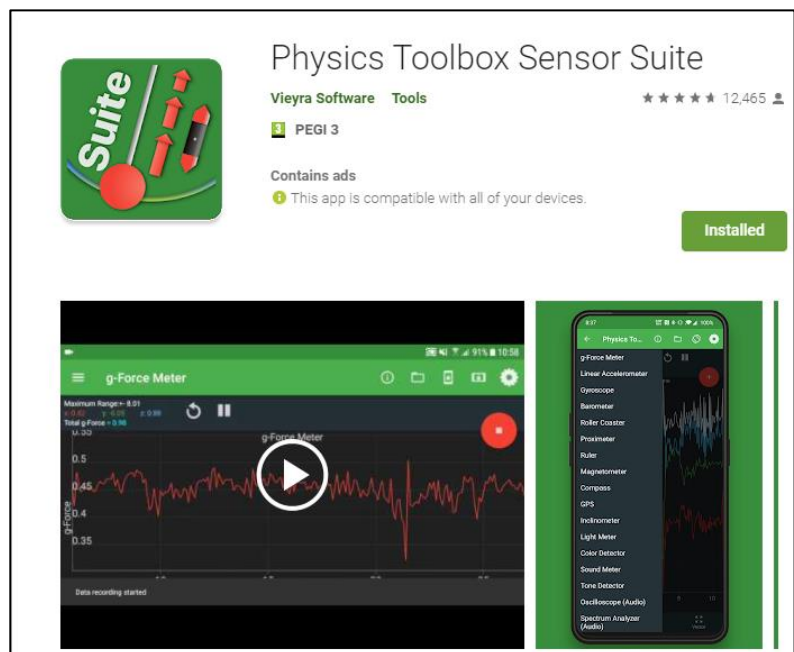


Most of the above equipment was purchased separately and provided to many of the program schools, over the last few years. We now plan to package and integrate the modeling and test gear, including simple water devices like gauges, hydraulic valves, filters, pups, membraned etc. as well as general purpose educational scientific measurement devices and data loggers. The equipment will be arranged in movable packages such that it can be used by several labs q classes or even schools. Many of the proposed experiments and model were tried in the past and specifically last year' and some were introduced and experimented with during the Teacher's Training. The strong interest in electronics and the proliferation of IoT (Internet of Things)' led us to include in the package basic computerized kits of Arduino (or similar) modules that allow some real time programing, desired by many of the students/teachers.



STEAM Kit packaging

Physics Toolbox another important device is becoming a viable educational tool – the **smart phone**, with applications such as Physics ToolBox the advanced smart phones sensor suite, computing power and highly capable display, camera and sound recording and generation, cell phones when properly used, can form the hub of an excellent physics tool box' which we now add t the research tool box. This activity is inspired by a program called Robo Physics, which harnesses the cell phone sensors and computing power to run high level (12th grade Physics graduation project). We adopted the approach to the middle school level, to the great excitement of teachers and students alike.



Physics ToolBox application

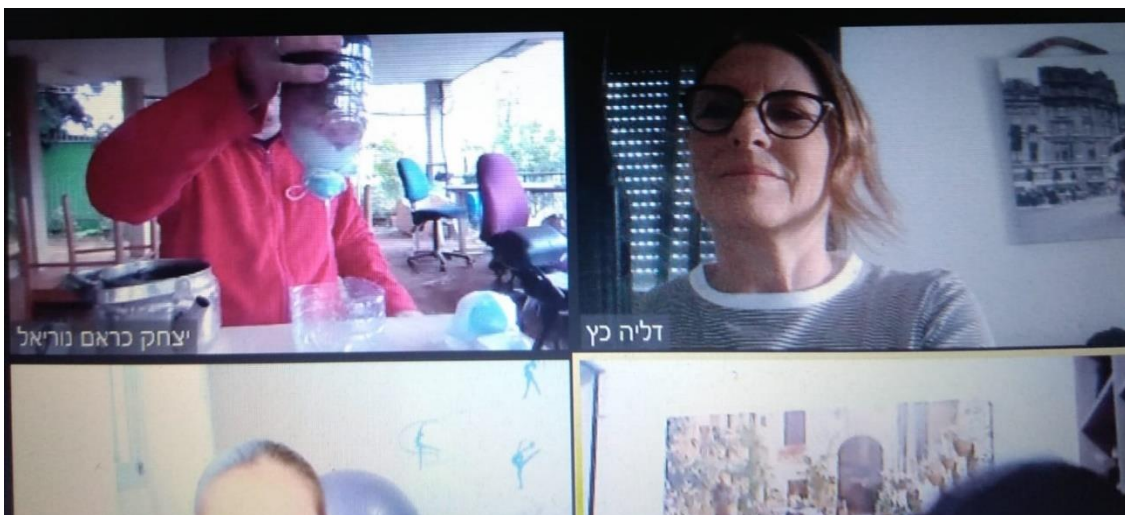
6. Research Projects

The research activity during the reporting period was limited due to the Corona pandemic as students actually visited schools only for a short while and intermittently. Doing actual science research at home was limited primarily due to safety concerns. Thus the research focused on Internet based activity and simulations. The experimentation was either performed at home with very safe procedures, or carried out through demonstration experiments, cried out by our coaching stuff and share with the students over Zoom.

Plant growth under different irrigation and lighting conditions was a research done by six grade students of Sorakis school in Kfar Saba, as an introduction to the Hydroponic system that was eventually put in place in a school class during the final school day when students were allowed to return to school. Strangely enough having to work on their own motivated the young researchers and their overall reaction to the process was positive. It served to boost their independence, increase their involvement, and broke the challenging routine of Zoom only lessons otherwise practiced. This was certainly an experiment in modern STEAM education with a lot to be learned from. It also helped the teacher, Dalia Katz, who was new to STEAM and helped promote the school's abilities in the field. The school now plans to continue with RHAW program next year and put in a full-size Hydroponic system next year.



Top: Surkis elementary school (Kfar Saba) Prepare for home experimentation shown below



In Jerusalem students of Sheik Jarrah Abdulla Bin Hussein girls' high school (The conflict area school in Jerusalem has been on the RHAW program for a number of years now) did run a field trip to the local pond reserve (Deer Valley), to study the water quality changes and winter flora led by coach Batool Salman.



Sheik Jarrah students in a STEAM fieldtrip in Deer Valley in Jerusalem



The **history of water pumping** and the orchards which provides a look into the history of technology was further developed including building old pump models using the advanced Lego gear. The pumps built and investigated now serve as key elements of the experimentation kit, and were researched parametrically. Newton's Free Fall parabolic function served as a research topic to investigate water jet trajectory created by a controlled electric water pump and captured by a smart phone camera. This subject was built and experimented with last year by the exceling Caucab high school and was further advanced as a broad general subject during 2020-21



2Fire extinguishing robot built by Kaukab students



Rode Pump (left) and a Lego functioning robot (Right)

The prospective view of Jaffa and the associated Orchards **Jaffa Oranges** industry became very relevant due to the Spanish Flue pandemic and the Vitamin C value of the oranges after WW-I which also connected to the new Corona content module. The reconstruction of many such old wells (Biara) around the country and mostly in the **Jaffa Tel-Aviv** area, supported local tours (many of which were done virtually) and served as a research topic for Jaffa students at the **Sant Michael Orthodox Christian school**, where **Najla hanan PP of the Lod Rotary Club** serves as school master. The National heritage site preservation council now seeks our advice to introduce STEAM activity into some of their leading orchard Museum, where we can leverage the old Diesel Rod Pump well as an inspiration for physics experimentation.



Figure 3 DKJA students at the Jaffa ancient antilic well site used as a escape room quiz during their visit to Jaffa

The "Slope well"

A set of ancient wells were discovered and analyzed by Archeologist Prof/ Avi Sason, an ancient well expert. It was reconstructed in Ashkelon Park and can be operated by students and visitors. Based on Hi-Teach generated description and STEAM experimentation outlines, Teacher Natan Ben Ari, of Zilberman high school in Beer Sheba, a long-time RHAW partner run with his students several old well mechanical simulations and tests. In the slope well a work bull pulled a big leather water pouch of 200 liter assisted in part by his own body weight walking down a sloping ramp. The numerical analysis and physical demonstration of the well's mechanism form an excellent base for relevant multi-disciplinary STEAM learning. **Beer- Sheba** ("Seventh well") is a biblical ancient town in the south Negev desert, wherein named in memory of the seventh well dug by Abraham (Forefather of Jews and Muslims) after a long fighting conflict with Avimelech king of Philistines ended in a peace treaty and a joint well. Abraham well (An antilic reconstructed well) is a valuable living monument in Beer Sheba, and the sloped well is reconstructed in nearby Ashkelon (A Philistine ancient capital where Simon blinded by Delilah, was tied to an old well and eventually distracted a temple) the slope well was reconstructed by **Gad Sobol** of the Park and Nature Authority, a long time RHAW partner. The well dates back to Roman times where Ashkelon was a flourishing agriculture capital growing and exporting pink onion for the entire ancient world. The agriculture in Ashkelon was based on around 70 wells in a very small area surrounded by walls). The unique pink onion is a subject of current genetic research attempting to reconstruct the onions as well. Thus, as can be seen the STEAM activity has mechanics, physics, mathematics, history, archeology, bible studies as well as international diplomacy with conflict and wars over water, ending with an eventual peace and a joint solution. And it is all rooted in the nearby school vicinity. A very current and relevant STEAM.

No wonder **Dr. Hefzi Zohar**, deputy mayor of Beer Sheba, herself a chemistry scientist who heads the education department, admired students work during a visit to the school. Dr. Zohar was honored with Rotary recognition during yearend ceremony held by the Rotary club where the RHW program activity was presented by **PDG Alon Bendet**, **President Yael Peleg** and W&S member **Aharon Katz**, and **Dr. Amir Barnea** the Hi-Teach coach.



Dr. Hefzi Zohar experimenting with Sloped Well model at Zilberman high school in Beer Sheva supported by the Beer Sheva RC led by president Yael Peleg and PP Aharon Katz

Sea related projects

In collaboration with IYFR several projects were implemented including purchase of sails for the Haifa Sea Scouts Sailing boats done as part of the effort to educate for the protection of sea from plastic, Similar courses and talks were run with Haifa schools focusing on total ecological footprint.

Experimental oceanographic research was conducted on the Estuary of the Yarkon river in Tel-Aviv. CTD profile (Conductivity Temperature Depth) profile vital for analysis of river life and underwater sound propagation were taken with a Neulog data logger set and with water sampler. The project was safely carried out with Tel-Aviv Sea education director (**Shabee**, a Hi-Teach associate coach).

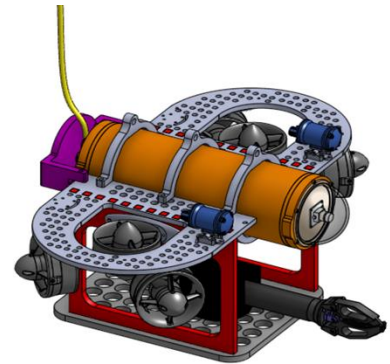


Yarkon river estuary where STD measurements were carried out in Tel-Aviv

Remotely Operated Underwater Vehicles (**ROV**) were designed and built by two schools, Ort Avin and Ort Oranit led by two leading Hi-Teach associate engineers-teachers. The functional robots include propulsion system, buoyancy and navigation and **Plastic Detection Sonars**

(Ultrasound). The work was presented at the Man and Sea competition exhibition in Herzelia run by the Israeli Dolphin submarine veteran's association. A very exciting tour was arranged for the students at the Haifa navy Museum (where many relevant underwater systems are presented, including a submarine and anti-submarine sonar carrying missile boat). The tour also included a visit with the Elbit Systems most recent Seagull USV (Unmanned Surface Vehicle) one of the world most advanced remotely operated sonar platform aimed to detect and hunt underwater mines and submarines. The students and faculty as well as the joining Hi-Teach coaches were thrilled with the visit. Dr. Shefi who has worked on these programs guided the tours and provided insight into the technology its development and relevance to the protection of sea and the environment.

A national photography competition of plastic sea and art was conducted and culminated in a photo exhibition at the Haifa National Maritime Museum. It captured attention with many educators who joined an active Sea Educators community. Hi-Teach sponsored the winning teacher prize (of a weekend at a beach hotel on the sea of Galilee)



ROV top and winning picture bottom



The *activity* is likely to grow with the association with the **Int'l Yachting Federation of Rotarians (IYFR)** that has put the protection of sea from plastic at it's focus. Three Rotary Clubs in Greece that planned to join the RHAW Twinning program last year were held back due to the Corona and we hope to see them (and other IYFR RC) join us next year.



Sails provided by the RHAW & BAZAN to Haifa Sea Scouts

Reconstruction process of the ancient sunk Roman boat (The Maagan Michael Boat) was explained and presented during the Science Teacher Training held by Hi-Teach in the Shlomi Science Teacher Training Center (Ministry of Education). **Yochai Paltzur**, a leader of the boat reconstruction project, which included actual sea sailing along the Mediterranean, with the reconstructed sailboat, presented the project to the teachers, along with the associated reverse engineering process. The project served as an inspiration for several student research project including the reconstruction of an old Roman pump and the reverse engineering evaluation of its energetic efficiency. Combining archeology with reverse engineering formed an excellent STEAM example.

GIS systems were the focus of another area of learning and exercise. The geographical mapping of water infrastructure uses GIS technology and the high school students **of Pardes Hana High School** explored **water quality** and supply system structure in their town based on Hi-Teach GIS content generated recently' and actual samples as well as Water utility reports, all done in association with the water department of the local municipality. The connection with the utility was provided by the local Rotary Club a RHAW program partner and contributor.

7. WATEC 2019

A marked cross-cultural event was the WATEC 2019 visit joined by 70 students and their teachers and accompanying Rotarians in the Tel-Aviv David int'l exhibition grounds where students and teachers spend a whole day together, Cross cultural teams formed to study world water & sanitation challenges, jointly scouted the Water technology exhibition, and together brainstormed on how to apply those technologies to address the presented challenges.

The **Watch 2019 Rotary symposium in Ashdod**, organized by the **Gedera and Ashdod Rotary clubs and the district water & sanitation committee and Hi-Teach** helped **formulate the Rotary focus of the Twinning Program**, following the thought process that started in Watec 2017 namely: Attempt promote awareness of the water & sanitation challenges, though education. Gathered in the event were all the long time Hi-Teach and RHAW supporters from the Academia, Industry and Rotary, and together the fruitful process helped form a coherent base for the Twinning Program.

The Watec convention and exhibition offered a unique opportunity for the program students and teachers, to get exposed to (1) Real world water and sanitation challenges (2) current advanced solution technologies being developed in israel and around the world (3) work together to try and apply the new technologies to the specified challenges and (4) Preset their fresh ideas to the water professionals presenting at the exhibition, see more on the cross-cultural opportunity the event represents



Girl Students study water quality monitoring equipment at WATEC 2019



Mixed Student Group present solution at WATEC



WAFI top management complements student on work presented at WATEC 2019



Uri Shor Spokesman of the Water Utility address students at WATEC 2019

8. Cross Cultural Collaboration

Cross Cultural events were limited this year because of the limited in school and outdoor activities due to the Corona pandemic social distancing and blockades. We did however emphasize the Cross-Cultural nature of the program and promoted the collaboration in a list of activities some over zoom and others when an opportunity was presented. The net result however, seemed to have been a remarkable success.

Teacher Training of which we had three formal Training Two during the two-school year (2019-20, 2020-21) which lasted 30 hours each and a three-day outdoor course during the 2020 summer vacation held in the Shlomi the science teacher training center, a unique splendid resort seminar grounds in the Galilee. All three trainings were joint Jewish Arab event.

A byproduct of the WATEC 2019 intense exciting joint event, of youth from all sectors working together on water challenges was **mutual respect, a cooperative creative effort, crossing the communication barrier and presenting together their joint product.** The natural respectful atmosphere was perhaps best demonstrated by a group of four religious Muslim students (from the Jerusalem Um Tuba boys school) that kneeled and pray at the exhibition hall corner and were naturally respected by everyone.



Batool Salman of Beit Zafafa Jerusalem talks in Arabic with Gedera (Jewish) students



The joint cross sector student group at WATEC 2019 in Tel-Aviv

A few RHAW School Twinning groups were also made up of joint Israeli Jewish Arab teams that together collaborated with overseas Twinning schools (Among whom there were also Muslims and Christians, both Orthodox and Catholic. The Twinning also provided an opportunity for the Jewish Girl's school (In Zichron Yaakov) and the two girls schools from Jerusalem, to work together with mixed schools providing indirect gender collaboration as well as crossing over the cultural bridge.

The virtual graduation events of both 2019-20 and 2020-21 school years, involving lot of preparation and joint presentation review required a lot of joint working hours that the students and teachers from all sectors spent together, providing ample opportunity to get to know each other.

And perhaps the most impressive demonstration of the cross-cultural nature of the program came about during a session with a class **from Romania** and a class from Haifa Ironi g where an Israeli Druze and a Romania Christian students discovered a rare ability to freely express themselves in English. Driven by Hi-Teach Dr. Shefi's coaching to dare talk "from their heart" rather than read from their notes" they started to freely talk, complementing and supporting each other in a marvelous manner and jointly reaching a coherent, self-confident and fluent communication skills to the great applause, by students, teachers and Rotarians from the classes as well as the entire Hi-Teach coaching team.

One such moment of revelation has an enormous impact on students, teachers, Rotarians as well as the Hi-Teach team reminding everyone what the RHAW the program is all about: Cross cultural collaboration is a joint address of the shared local and global water and environmental challenge.

Training the Miller House future coach team provided another unique opportunity for cross cultural interaction as the group of high school students that took part in the elaborate hydroponic system built with Hi-Teach support and guidance came from all sectors of the mixed multi sector Haifa community and worked together over a long period of three month, with a few sessions over Zoom but mostly in physical meetings held under strict Corona social distancing but with close and open personal relationships in the meetings as well as outside the meeting using a joint Hydro Maker WhatsApp group. The group stuck together under the leadership of Mayar completely ignoring the sectorial differences was a result of the course Project Management and Team Collaboration principles taught by Hi-Teach on the early stages of the joint program' as well as the supporting spirit of the Miller House support for the all sectors address led by Moshe Bachar Miller House manager and Haifa RC member' and

his team made up of Sharon, Yosi and Oz. The unique excellent project was joined by the entire Hi-Teach coach team, served as an inspiration for the team as well as an exemplary project for the new recruited coaches, The constant need to care for the produce and the growth required continues attention physically and over the internet and mobile phones, which kept the project active 24/7.



Mixed Haifa student group collaboration at Beit Miller

The success of the RHAW cross cultural collaboration story is further emphasized as it was run during the challenging period of heavy violent conflict in Gaza and Jerusalem around the Ramadan of (May 2021) when violent cross-cultural riots were tearing mixed cities apart. The sustained mixed society project served as a genuine proof of concept for the program immense value as a practical bridge.

Cross Cultural Events			
Real/Virtual	Event name	# of Event	# of Meetings
Physical joint events	Teacher Training	1	5
	Waterc	1	1
	Miller House	1	5
Virtual meetings	Teacher Training	2	10
	Twinning Sessins	12	12
	Graduation preperaton	5	5
	Graduation event	2	2
Total		24	40

9. Teacher Training

Teacher's training is by now a major central activity having evolved into center stage over the last three Global Grant and over 16 years of Hands Across Water evolution.

We now understand that turning the Teacher Training into the focal activity allows further proliferation of the program with larger reach and more impact. This was emphasized during the reporting period as the Covid 19 pandemic limited in school direct student interaction, and as the int'l Twinning Pilot clearly emphasized that the student reach is achieved via their students mostly.

The Teacher training became ore intensive, longer, more structures with more experience gained and with a growing recognition by the Min of Education both in Israel and abroad. The credit teachers receive from the ministry of education and the approval of the RHAW as a professional development course provides great motivation to the teachers, for whom the PBL, Research based STEAM is new (and at times scary as it requires change and adaptation, and at times is a cause of concern). The structured feedback review conducted at the end of each training experience are usually very positive. And the practice has been used as the main avenue to reach to the overseas Twinning Schools, much to the liking of the Int'l teachers,

Several formats were used in the eleven 11 training courses with 214 attending teachers,

- (1) Physical meeting trainings
- (2) Virtual meeting trainings
- (3) Hands on PBL Research, STEAM trainings
- (4) Twinning School Int'l training.
- (5) Specific virtual graduation event training
- (6) Professional STEAM trainings (plan, conduct and deliver)
- (7) Hi-Teach coaches training.

They formal three TT courses concluded with formal evaluation reporting based on teachers performance during the course. Homework and student work consisted of the products produced through the RAHAW path, from work plan all the way to the delivered students product and active participation in the graduation events. A unique approach of teacher evaluation based on their student work.

As expected, the tool evolved and became a corner stone of the Twinning Program as originally planned "To be the best assurance for program sustainability, providing a fishing rod rather than a fish". In the future we hope to be able to involve local academic experts in the conduct of the Teacher training sessions what will be run locally in every partnering country. We also plan to host Teacher Group visits



Teacher Training at Neulog SES facility, before the corona...



Int'l Teacher Training over zoom 2021

Rotary Hands Across Water 2020-21 teacher's training						
#	Aprox date	Location	Sector	Audience	Teachers	Organizers
1	Mar 2020	Grad Event	IL	Teacehr, Student supporte	30	Hi-Teach Rotary
2	Oct 2020	Int'l teacher's training	Int'l	Int'l teacher's training	30	Int'l education experts,
3	2020	Water/Sea/Physics teachers	Jewish	Physics & Marin teachers	10	Hi-Teach, Herzelia SC
4	May 21	Physics Teacher Training	Jewish	Cabri & Tel-Aviv	15	
5	July 20	Shlomi	Mixed	Teacher Training	20	Min of Edu + Hi-Teach
6	2019-21	Year long Teacher training	Mixed	Teacher Training	30	Min of Edu + Hi-Teach
7	2020-21	Year long Teacher training	Mixed	Teacher Training	29	Min of Edu + Hi-Teach
8	2020-21	6 country Training courses	Mixed	Teacher Training	20	Rotary Hi-Teach
9	2020	Hi-Teach coach train 2020	Mixed	Coach Training	10	Hi-Teach
10	2021	Hi-Teach coach train 2021	Jewish	Coach Training	10	Hi-Teach
11	May 21	Community training	Jewish	Miller House Community	10	
				Total	214	
Total 11 events, 214 attendants						

10. The School Twinning Pilot

During the Water & Sanitation committee visit to **Cluj Romania** in 2016 we presented the RHAW program as a water & sanitation education initiative the committee had partner with in 2012. The hosting team made up of **Dr. Florin Iliescu, PP of the Bistrița Nosa RC** and local partners and Rotarians expressed interest in the RHAW program, and a thought process commenced as to how this can be shared.

PP Florin wasted no time and started a local water education initiative focused on **Sanitation and Hygiene** that connected him with schools and the education establishment in Romania. Hi-Teach begun to explore the idea of international collaboration with its partners in Israel and the USA like WRAP (Water Resource Actin Group), a partnering NGO led by Brendon McGinnis, and others in Florida, Washington DC. and New-York. The general response to the international expansion idea was positive. But a clear view of how such an expansion can be done was missing.

PRI Barry Rassin visited a joint Jewish-Arab schools' session in Jerusalem during his last tour as PRI in June 2019. Barry concluded at the end of the visit "Education, Water, Peacebuilding Pure and Simple: THIS IS ROATRY, please find a way to take it to the world", the call for action was clear and loud.



Hi-Teach developed an international collaboration program based on lessons learned during the WATEC 2017 talk with **Prof. Uri Shamir**, past director of the Israeli Water Authority who described the global lack of awareness of the water challenges, the potential solutions, and the immense financial investment in water infrastructure worldwide (estimates reach 40 trillion dollars). An investment of a scale that in turn depend on broad public awareness. Now there was a clear motivation of a global scale to promote such public awareness where the young generation can be instrumental in understanding the challenge and the possible solutions as well as the need for huge investment, both of which will have direct and immediate impact on the students' lives in the future. The students now become partners. Learning changes, "**Engagement**" the elusive key to effective learning is suddenly looking you in the eye.

Using Hi-Teach (1) Expertise with relevant water & sanitation inspired STEAM education, and (2) Pronounced successful past record with school of all sectors of the diverse Israeli society and (3) The decorated creative execution skills that granted the RHAW a TRF

Noteworthy Project Recognition, all come together in support of development of a global program and the RHAW Twinning Program was starting to take form.

The Twinning Program will allow schools from around the world, to study their local and the global water & sanitation challenges, using multidisciplinary STEAM approach and team up with the program schools in Israel to compare notes of their respective observations, aiming to increase their awareness of the growing challenge and its potential solutions while they study sciences and technology environment and history in a broad applicable sense.

When **Florin from Romania** visited Israel during the WATEC 2019 Rotary conference, along with **PP Ralphy Jhirad** from the Bombay Queen city RC in India, the program outline was already formed. We took advantage of the WATEC 2019 gathering to present the general idea, polish the program goals and started to structure a model pilot and an action plan to develop and launch and support it, which we also presented and discussed with our **USA partners** during our Feb 2020 reporting visit where the plans for the 3rd TRF GG were taking shape.

While the idea seemed of general potential there was however quite some skepticism since it would have to be tailored to the different countries and education systems. Hi-Teach hit the drawing board and put together a Twinning Program which called for schools to study their **local** Water & Sanitation challenges and evolving solutions (or lack thereof...), under general guidance and some lead examples. The world schools were to then team up with the program schools in Israel to cooperate by comparing their respective **observations** and future prospects, not necessarily working on the same challenges as those were expected to be different for each country.

A detailed Twinning Process was also outlined and documented. It included (1) Overview introduction and recruitments of twinning Rotary clubs (2) School introduction and recruitment (3) Identification and study of local water issues and curricular relevance (4) Teacher STEAM training and OJT support (5) Recruitment of local support partners like Utilities, Academia and Government and municipalities. (6) Teaming with twinning schools in Israel (7) Preparing for a joint yearend graduation event on int'l water day

Twinning Process

1. Train teachers, provide content, coordinate twinning
2. Identify focus area with local curricular value
3. Study science background, water challenges & solution
4. Develop STEAM project
5. Connect with twinning class
6. Share and discuss products and reports
7. Spread the word



תהליך תאומים

1. הכשרת המורים בבתי הספר התאומים
2. זיהוי תחומי עניין וזיקה לתוכנית הלימוד
3. למידת הרקע המדעי, חברתי כלכלי
4. פיתוח פרויקט חקר מדעי STEAM
5. חיבור בתי"ס תאומים
6. שיתוף עבודות ותוצרים
7. הפצת הבשורה



נוער שותנה מים ודעתזכויות יוצרים – היי-טיב

Figure 4 Twinning Process Outline

The development of the concept was very demanding and took almost a whole year to evolve. It included back and forth dialog with potential twinning program pilot partners, and actual exercise challenge through the effort to convince partners to join in. It also required development of English content base for use by teachers and students. The result though was simple and promising. And the new content includes the following key items.

Some past interactions between RHAW schools in Israel and abroad with Hi-Teach involvement, helped gain insight into international school collaboration. It included work with Globe program (sponsored by NASA), JNF and other agencies involving schools like DKJA in Boca Raton Florida USA, Hahoresht in Zichron Yaakov three high schools in Naharia and schools in Bergen County New Jersey, USA as well as with Ajyal an Arab school in Jaffa in Israel. Cross-cultural collaboration of RHAW schools in Israel was also a source of relevant experience on what works and what does not work. Together this formed the basis for the practical Twinning Program Development. In the development process we also consulted with the Academia including Professors Furman, Friedler, Shani, Laster, Gvirtzman and Chefetz), as well as with Bermad our supportive industry partner that does command a broad international base.



Figure 5 The DKJA visit to Ajyal school in Jaffa

Program introduction including Program goals, processes, timeline, Hi-Teach support, and content map, and key STEAM education principles.

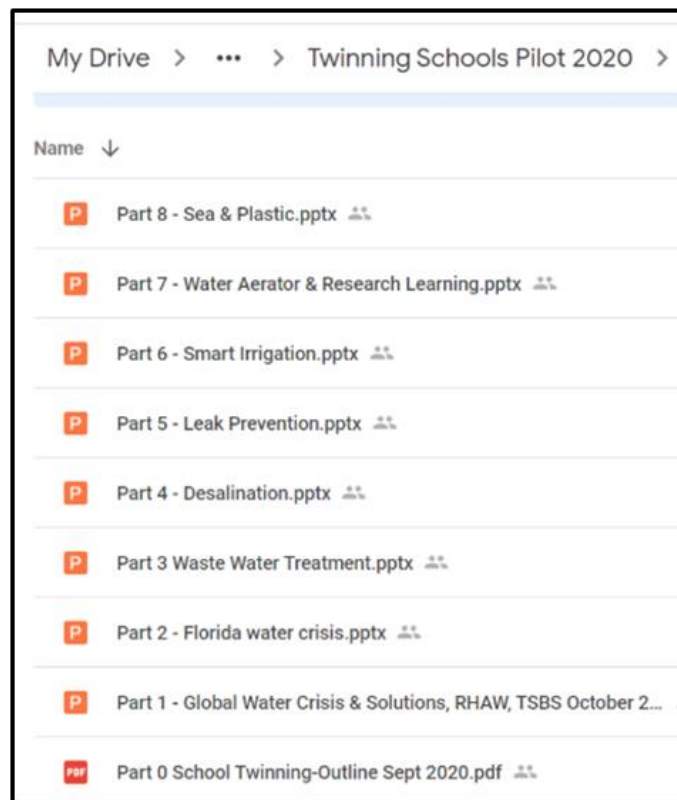
Water & Sanitation challenges and solutions – A global overview with Israel as an example

Key solutions examples including

1. Reclamation of wastewater
2. Seawater Desalination
3. Prevention of leakages
4. Smart irrigation and modern agriculture
5. Water systems management
6. Smart water usage and savings at home
7. Application of water technologies as STEAM

The experimental content was placed in an internet-based content depository. It was reviewed and polished, and eventually translated to some local languages such as Romanian.

The virtual VR 360 tours initially taken to overcome the inability of schools in Israel to visit water facilities due to the Corona pandemic blockade, turned out to be very useful as the created virtual You Tube tours, were made available for the Twinning Schools as well.



Web based Twinning Content Library

The program development effort was significant and required a meaningful Hi-Teach investment and effort. In parallel a Twinning Pilot element was introduced into the third Global Grant application and twinning opportunities were offered to the first group of Rotary clubs that held close relationships with RHAW supporting RC in district 2490. The plan was to have five pilot schools around the world during the 2020-21 school year. Once offered the response was surprising and eventually yielded seven (7) partnering countries: Romania, Poland, Albania, Kosovo, Lithuania India, and the USA, and fifteen (15) schools.

The Twinning Pilot was formally launched as the school year started towards Sept 2020; Training the Rotary Clubs went well over Zoom as the world reverted to virtual meetings due to the expanding Covid19 pandemic. The social distancing constraints did slow down the actual activity with schools' students, however it did allow gradual buildup of the activity learning form the gained experience and improving as the program progressed. Eventually after the 2020-21 winter vacation the addition of schools, teachers and classes was streamlined and towards February 2021 we did have 15 schools active and engaged in the program, more than the planned 5-10 range. All went as planed overcoming the Corona aside from India which was unfortunately severely affected by the pandemic and had to completely halt most of the learning activities in the prospect schools.

Teacher training commenced with the introduction of water & sanitation challenges, basic STEAM education and a guide to study of the relevant local water issues, which naturally were very different from country to country. From pollution of natural resources and reservoir to draught and lack thereof or flooding and the risk of the associated pollution.



Twinning School Pilot around the world

The schools selected the most relevant chapter to be used and commenced work on their research projects. The projects were planned to be short since as they started late but needed to be completed and presented towards the int'l water day on March 22nd. Surprisingly all schools managed to overcome the time challenge and were quick to respond and most research products were good enough given the extremely short time and Corona constrains to allow the twinning process to continue.

As the research projects near completion and the schools had a product to show and share the twinning with Israeli school began, using Zoom which was familiar to everyone. First the teachers got to know each other in separate meetings then the student teams joined in as well. The general curiosity and the available content and products to share, and the challenge and ability to communicate in English, foreign to most, helped turn the zoom meeting to an exciting, welcomed event. Timing was carefully planned, with meetings running at a growing frequency starting once a month and ending once a week.

The need to quickly prepare for the joint **virtual graduation** event, set to **March 17th** to fit school calendar around the spring holidays, turned out to be a good common cause that helped drive a focused collaborative effort. Posters were prepared and polished. Presentations were drafted, Rehearsal were conducted, YouTube presentation video clips were taken and shared.

While the pilot was underway, a comprehensive new web site was designed and developed to support the twinning collaboration and the graduation event ([see next paragraph](#)). The entire collaborative preparatory effort involved close to 100 people: Teachers, Hi-Teach coaches, Web designers, event production team and the formal event organizers, went into full motion. Invitations went sent out, and the actual administration of the challenging virtual event was planned and rehearsed by the full Hi-Teach team. The process included guest admittance processing, management of the six event halls (two general assembly halls, three breakout rooms and one poster exhibition hall).

Cyber protection and avoidance of hostile interference were planed and rehearsed. While this required a lot of attention, a backup management communication channel, and a security officer assignment, it eventually tuned out to be very important. Three (3) such hostile cyber-interference took place during the event meetings and were easily countered by the qualified team and the means prepared in advance.

The event preparations, which involved many people (close to 100) was a joint journey with a shared interest in the event's success. It included the presenting teams, the congratulating key visitors from the ministry of education, the water utility executives, water industry and academia as well as many Rotarians including past PRI Barry Rassin. Eventually the 375 participants of the online event enjoyed a unique adventure, sharing a sense of history made when a first global collaborative Water, Sanitation and Environmental inspired educational program is launched.

Following the RHAW Twinning Pilot and 2020-21 school year graduation event, a formal **feedback study** was conducted using Google forms, and the general feedback was very good. Satisfaction with Hi-Teach guidance was 82%, and satisfaction with school collaboration was 74% despite the very short time allowed for interaction due to the late start and the Corona virus. Average increase of water challenge awareness rose by 60%, and 100% of the schools plan to continue with the program next year, and 73% of them will recommend the Twinning Program to other local schools.

Bottom line is that the **Twinning Program pilot was very successful**, and the concept proved to be very valuable. It appears to be a solution to an existing need. Advanced application of water and sanitation inspired STEAM aimed to promote awareness of the challenge and its potential solution around the world, is a leading viable and applicable example of a global collaborative care for the environment.

We now plan to implement the lessons learned in the pilot, to streamline the registration and logging of school and teacher contact and preferences information. We will simplify the teaming process, content offering and research planning, products management and more.

We plan to run the next stage seamlessly from the registration to graduation, including the teacher training and the school twinning process, and to design a tailored web service to support the process. We also plan to expand the twinning content base, offer more Poland



Students RHAW Picture Competition

alternatives. We aim to recruit more schools and partnering with the water utilities as well as the academia and local education authorities. Given the direct value the program brings to the Utilities in the ability to intelligently communicate with their served communities, we plan to strengthen our relationships with the utilities as we do in Israel, relying on their involvement and support.

11. Graduation events

Past lucrative yearend events at the Technion where students presented their work to educators, academia and partnering guests inspired the two recent virtual event imposed by the pandemic and celebrated together with the Twinning Schools from around the world.

The 2017-18 graduation was honored by Rotarians, Ministry of Education, the Water Authority and Technion faculty and retired **Admiral Ami Ayalon**, past Chairman of **Netafim** (Dripper giant), a decorated hero and **past CNO** (Chief of the Navy) and head of the Internal Security Services (Israeli FBI) who as **member of the Knesset** (Israeli parliament) has been a **strong advocate of Israeli-Palestinian Peacebuilding efforts**. Ami's interest in the RHAW and student work was inspiring as were similar dignitaries like **Giora Shaham** the **director of the Israeli Water Authority** in 2018-19. The yearlong teacher and student efforts climax at the Science Fair like events, and the need to sustain the tradition was the drive and model for the virtual events effort, which proved to be worthwhile.



The 2018-19 graduation science fair honored by Adm. Ayalon, Water Authority chief G. Shacham and Haifa Rotarians inspired the virtual graduation events.



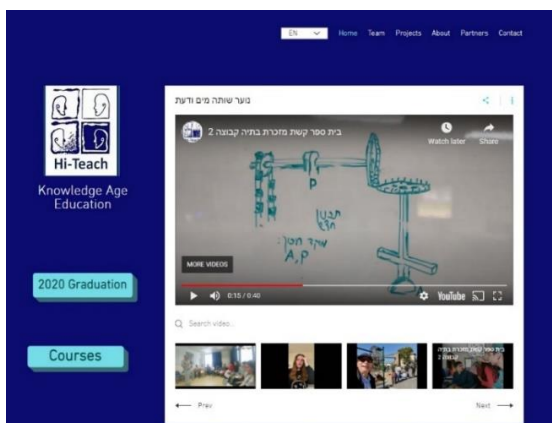
The past water trivia quiz competition between a mixed "North and South" groups was replaced by a virtual cellphone-based Int'l water quiz with all the audience participating, greeted by PDG Fuchs.

Two virtual yearend events took place, in 2020 it was improvised when the first Covid 19 breakout prohibited large gathering, for 2021 we were experience and were better prepared.

The 2019-20 blockade caught us by surprise, with invitations to a regular event at the Technion, all sent out already. But the restriction on elderly gathering had limited Rotarian participation and provided motivation to go virtual and a way to implement it as the public was quickly getting familiar with Zoom.

Effort was made to develop student (and teacher...) web presentation skills. A week of intensive rehearsal with teacher, students lead by the Hi-Teach team resulted in a coherent two hours 2020 event conducted as an online interview of teachers and students. Dignitary greetings were added from ministry of education, the industry and local and Int'l (USA) Rotary.

The almost flow less conduct of the 2020 virtual event was well received and complemented. **“It taught us how to run a virtual event”** said **Dr. Ofer Mochadi**, superintended of science education at the time. The event had no special web service support, it was recorded, and the recording link presented on the modest Hi-Teach web site. Also presented was a playlist of short You Tube clips of student work, that formed a panorama of student work. The experiment inspired ideas on how such future events should be handled and look like.

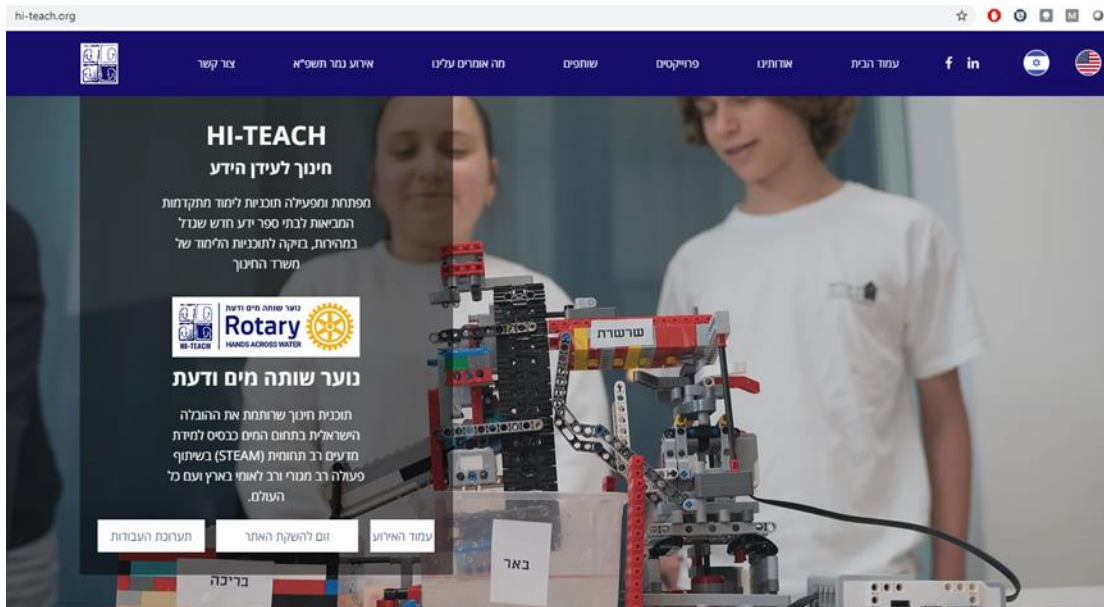


Left: The 2020 virtual event web site. Right Education ministry supervisor Dr. Mokadi & Hani Peleg congratulation.

In 2021, towards the end of second yearend under corona constrains, and now with overseas schools to consider, we set the bar much higher, we had more experience and more time to prepare. We designed, developed, tested, and practiced a tailored made new web site which was based on the gained experience. It was designed in a short time and we managed to prepare and rehearse the school teams to use it (see the paragraph on the **Twinning Pilot**).

The dual language web site (www.hi-teach.com) is a success that will help promote the program further, especially with Twinning Schools around the world for years to come. While the development was costly in effort, attention, and cost, it proved valuable during the challenging Corona yearend when all schools operated virtually over the net using zoom and You Tube. We plan to maintain the lead on virtual operation and collaboration next year with more features and tools. As planned, we also devised a new logo for the program.

The 2020-21 graduation event hosted 375 participants from Israel and around the world and included the required cyber security measures. It allowed us to run a virtual Science Fair and a professional Rotary hosted education conference. It presents Students Posters, Video clips and three parallel breakout rooms as well as a general assembly with greetings and congratulations by all the partners culminating with a recorded greeting of past PRI Barry Rassin who was impressed by the international reach of the program which was initiated by his call “...to take the program to the world”.

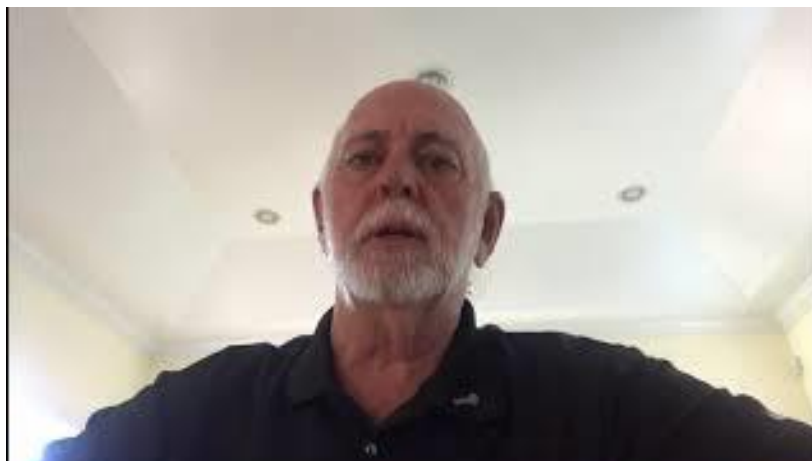


The new Hi-Teach web site hosts the 2021 yearend event.



Above Bili Friedman (Min of Education 2021 supervisor, herself a Hi-Teach graduate!) congratulates the 2021 Int'l graduation

Below PRI Barry Rassin congratulated the 2021 graduates



The event layout and orientation page present an orientation map for the three hours event

The screenshot shows a website interface for a graduation event. At the top, there is a navigation menu with links for Home, About, Projects, Partners, Testimonials, Graduation Event 2021, and Contact. Social media icons for Facebook, LinkedIn, and YouTube are also present. The main content area features a schedule table and a breakout rooms table.

Activity	Format	Start	End
Doors opening			3:30
Welcoming session, poster gallery visits	Event website and Zoom webinar	3:30	3:45
Greetings, Year activity and Twining Program launch	Zoom webinar	3:45	3:55
Projects presentation breakout session	3 parallel zoom rooms	3:55	4:45
Guest Speaker Prof. Choreve.	Zoom webinar	4:45	5:15
Water quiz and graduation ceremony			

Breakout Rooms

Room 3 חדר 3 (English)	Room 2 חדר 2 (English)	Room 1 חדר 1	#
"EuroEd" College Iasi- Romania	"Ecaterina Teodoroiu" College Targu Jiu - Romania	סורקיס כפר סבא	1
החורשי - זכרון יעקב	אל חלאן - סבנין	הנגיד הרצליה	2
Specjalny Ośrodek Szkolno-Wychowawczy- Poland	ראיל מטוס - חיפה	אורחורקסי רמלה	3
עבדולאה חוסין - שיח' ג'ראה - ויחוליס	Obrowo primary school - Poland	בית אקשטין גבעתיים	4
Liceum Ogólnokształcące Niepubliczne- poland	ברנקו וויס - בארי טבע	תסון טבע	5
אורט ארצות	Szkola Podstawowa - Poland	החולאי - סרדס חנה	6
Gimnazjum im. J. Śniadeckiego - Lithuania	מקריה ג' - שפרים	אל סרמה - חיפה	7
גילי - זכרון יעקב	Qemal Stafa - Albania-1	ראיל סטורס חיפה	8
Shkolla e Gjelbr - Kosovo	Qemal Stafa - Albania-2	מקריה סאוב	9
סטאה חוסין - סבנין	עונה ל'בוסקטין - בארי יעקב	השיבה התוכנית - זכרון יעקב	10
Donna Klein- USA	Švenčionių r. Pabradaš „Zaimenos“ gimnazija - Lithuania		11
אבן - רמת גן	Shkolla Mienumi i Tretë - Kosovo		12
Ismail Qemali - Albania 1	פני - זכרון יעקב		13
Ismail Qemali - Albania 2	מקריה ד' - אסקולן		14
"Tudor Vladimirescu" College Targu Jiu - Romania	"Emanuil Goju" College Craiea - Romania		15

Event Map and orientation table on the new web site

The virtual event web site included the following functions.

- Entrance Hall** with welcome' info. And welcome activity
- Poster and Model Hall**, presenting student's work.
- Breakout Rooms** (3) for 1:30 hour of 15 short student groups talks about their work.
- General Assembly Hall** for greetings, program overview, and an Int'l fun water quiz.

The design was inspired by WATEC conferences and the exciting past graduations in the Technion (Held at the Grand Water Research Institute). It used a modern virtual conferences concept, practiced worldwide in response to the pandemic social distancing and Int'l travel ban, which was also applied for recent virtual Rotary Conventions.

12. Involvement of the Rotary Clubs

Thirty-Six (36) Rotary Clubs and districts (4) were involved with the RHAW program during the current grant period a **64% increase** from the previous grant (RHAW 2nd phase GG1640670 Global Grant where 22 RC and districts were involved).

Twenty (20) RC from the local District (2490) are very involved with school selection, school program activity as well as with the twinning RC around the world.

The new RC were introduced to the program by the district Water and Sanitation committee lead by PDG Avner Fuchs, the Haifa host club, and the active program RC partners, as well as the Hi-Teach team. A long list of twenty activities and involvement options is proposed to the clubs. It includes selection of participating school, connection with local water utilities, interaction with municipalities, industry and academia and more, all listed and described in a detailed **Rotary Club Involvement Guide for the RHAW program**.

The activities were distributed in a document and described by zoom or physical club visits and QA sessions. The involvement plan is tailored for each RC and is supported by Hi-Teach.

Hi-Teach coaches periodically report to the club contact Rotarian on the program progress, challenges and required adaptations. Rotarians joined the program key events such as the School Twinning process, and the virtual graduation event where close to one hundred Rotarians took active part. (see the recorded multi-phase event at www.hi-teach.com). The established practice of RC involvement practiced since the program early stages, turned out to be very valuable as we launched the Twinning Program, as the RC around the six participating districts and countries quickly adopted the established practice which was translated to English and presented to the Twinning Rotary Clubs.

Regular meetings were held by the District Water & Sanitation committee where Hi-Teach was invited to report on the program progress, challenges, required adaptations and future. The district W&S committee forms an excellent steering body for the program since all the participating RC are invited to send "Water Trustees" to the meetings, where they can learn about the program activity, raise concerns and offer solutions and help. It is a viable body that meets once a month physically or virtually over Zoom,

Global Grant Phase-III application

Applying for the third grant was a lengthy process that commenced mid 2019 following the formal report of the previous grant. It was formally approved on July 10th, 2020, (commencing the formal reporting period) while the actual donation collection and formal use of proceeds approval was granted on June 25th 2020 almost a year past the 2019 completion of the previous program grant. The gap between successive grants of one successful program is a meaningful challenge to a long range sustainable program. It was bridged by private interim financing provided by Hi-Teach and other partners. This, however, cannot form a basis for a long-term sustainable program especially in view of the program success and planned future growth. An overall timeline is presented herein with a detailed table in section 22 Tables

From: daniel.weyl@rotary.org <daniel.weyl@rotary.org>

Sent: Friday, July 10, 2020 4:57 PM

Subject: Rotary Global Grant GG2099026: Application approved

Dear Rotarians:

Congratulations! Your global grant application for funding to promote cross cultural collaboration through STEAM education on water and conservation challenges in Israel and globally, submitted by District 2490 and the Rotary Club of Coral Springs-Parkland, has been approved by The Rotary Foundation. The award is in the amount of US\$ 133,600.

This letter serves as formal notification of your grant approval and explains what you must do to receive grant payment. It also contains important information for grant-funded travelers and links to additional resources.

From: grants@rotary.org <grants@rotary.org>

Sent: Wednesday, January 6, 2021 11:35 PM

To: geraldsussman@hotmail.com <geraldsussman@hotmail.com>

Subject: Payment Initiated for Grant: GG2099026 - Rotary Hands Across Water Phase-III

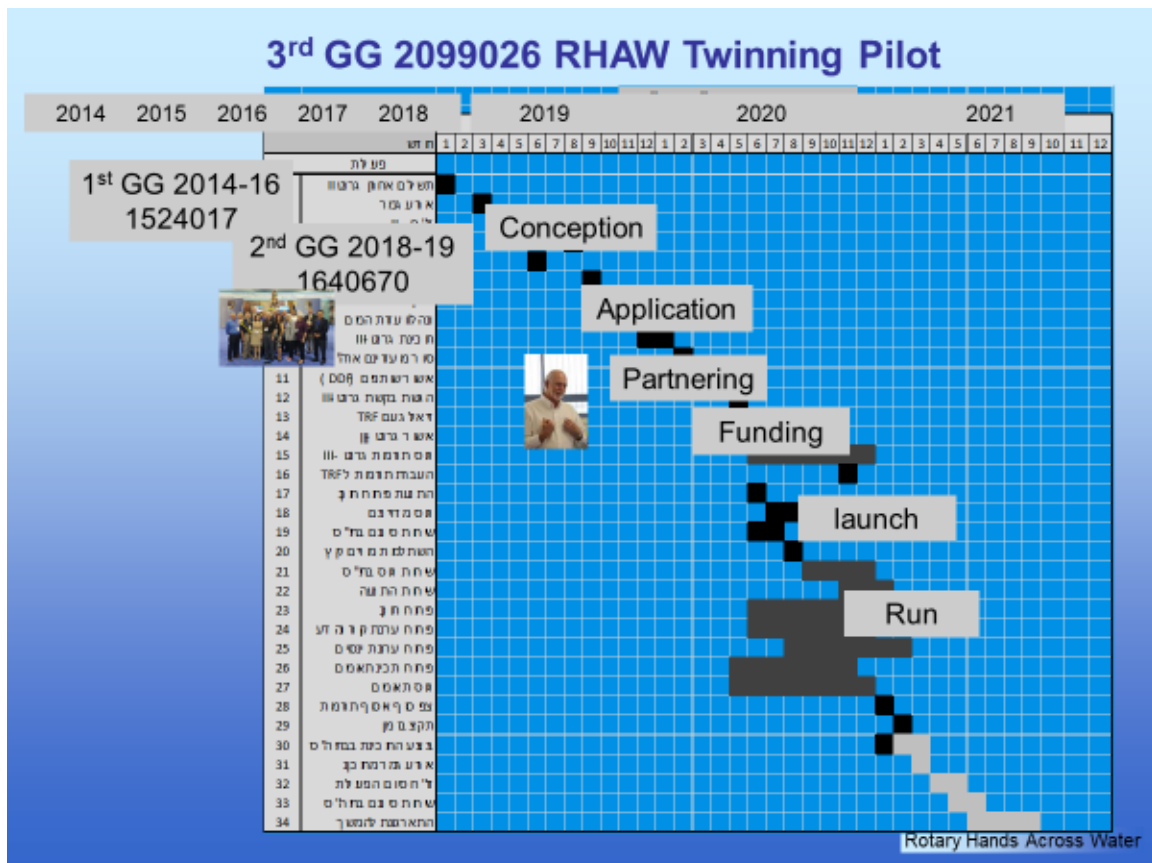
Dear Rotarians:

This is an automated notification from The Rotary Foundation. The payment for this global grant has been issued by The Rotary Foundation to the bank account you listed in the Grant Center. Allow five to seven business days to receive the payment. Please view details of this payment below:

Payment method: EFT

Payment amount: **\$108,660.77 USD**

Key events in the Global Grant application project



Specific Rotary Club Activities included the following:

The Rotary club of **Zichron-Yaacov (ZY)** kept his lead with **ALL** the schools in the small town participating in the program including municipal support, led by **PP Avi Tseiri**.

The Haifa RC, the biggest RC in the district 2490 has been host of the RHAW program Global Grants managing and reporting the financial aspects of the program. The formal grant activity was managed by a joint committee made up of Haifa RC members led by VP Natan Feldman, and the District W&S committee members, jointly chaired by PDG Fuchs.

The **Haifa Host RC** also run a series of informal education activity in association with RHAW. It involved the RC owned **Miller House** youth club (Operated jointly with the Haifa municipality), and the **Haifa Sea Scouts**. A number of water related functions were run by the Haifa RC including (1) A Maker Lab, (2) A community oriented Hydroponic system, built with a mixed sector youth leadership team training using robotics and computerized monitoring which was coached by Hi-Teach (3) Youth debate course, (4) Community environmental photography competition (5) Purchase of a set of sails for the Haifa sea scout boats that took part in the "Clean sea" initiative run with IYFR (Int'l Yachting Fellowship of Rotarians). Bazan refineries and Hi-Teach donated the funds for the sails and two RC from Greece were invited to join the initiative in a twinning effort, which unfortunately did not materialize yet due to the Corona pandemic constrains in Greece.

For a detailed account of the Haifa informal education activity see chapter 25.

The Beer Sheva RC led by **President Yael Peleg** and water trustee **PP Aharon Katz** and **PDG Alon Bendet** were very active and supportive with two schools involved in the program. **PP Avi Yanos** heads the education department at the nearby Eshcol region spearheads the RHAW rich activity with the local schools.

The **Carmel RC** (also from the town of Haifa) led by president **Neta Marom** was very active tow and recruited three main Haifa schools to the program.

Mazkeret Batya, were involved with the activity tailored for their two schools where the RC installed two aquaponics systems. The old antilic well reconstructed in the school back yard was also used for physics STEAM experimentation and a review of well technology evolution.

The **Kiryat Gat RC** with **president Evgeny Rolbin**, and **PP Ytzhak Abt** and **PP Hezi Ben Yaacov** and **PP Polina Berger** were also involved and very supportive with the **Arie Meir high school** exceling in the program.

The **Ramle RC** was very active. The club promoted the twinning with Poland, Lithuania and India and added a Christian orthodox school in the hometown of Ramle that now plans to join hands with a Jewish school in cross cultural collaboration research and another Lod science focused Muslim high school that plans to join in 2021. The intensive activity was led by **PP Shlomo Bronher** and **PP Zipora Meir**. Shlomo Broncher was granted a Paul Harris 2nd Fellowship by the program W&S steering committee and the Haifa host RC.

The RC of Beer Yaakov was also very active with two schools joining, and more planned for the future. Rn Ilana Solomon, a past teacher, was very involved in recruiting the school, the Rotary club, and the municipality to the program. Their participation was very successful.

The Rotary **Club of Ashdod** was also very active adding three (3) schools to the program and staying involved in the activity, helping to shoot the virtual tour video in the desalination

facility and more. The Ashdod RC run the **WATEC 2019 Rotary Symposium** jointly with the **Gedera RC** that was active during the entire period. The WATEC Rotary symposium joined by Rotarians from Israel, Romania (Dr. Florin Iliescu) and India (PP Ralphy Jhirad) was where the formal goal of *“Promoting awareness to the water and sanitation challenge and solution through youth education”* was established.

The **Gedera RC** that celebrated 30 this year, has been very involved in the program since its beginning and continued to support it during the 3rd grant lead by president **Mazal Cohen** and many others including **Aharale Zoraski** and **PDG Fuchs**, and the entire RC.

The **RC of Kfar Saba** lead by **Rn Tovi Arpe** was very active and recruited the **Sorakis** elementary school which did take a very active part in the program despite the Corona.

The **Carmiel RC** supported by the program and the activity was led by **PP Menachem Zilberkland** **PP Ety Shparberg** and **PP Itzik Kirshenbom**. We hope to see more RC's in the Galilee in RC of Segev and RC of Rame join the program with the many sectors and cultures of the historical mountainous Galilee.

The **Herzelia RC** donated and attempted twinning with a NJ RC which we hope will succeed.

The **Nesher RC** donated and added two local schools in the 2019-20, The schools did not continue to lack of school faculty commitment. We will attempt to rejoin them now.

The **Ramat Gan RC** studied the program closely but stayed tentative pending school interest which eventually rose with the successful joining of the Ort Avin school.

The over 100 years old Jerusalem RC (first in the country) led by **PP Shlomo Khayat** stayed involved with the program and the five Jerusalem schools.

International and Twinning Rotary clubs were also very active program, including.

The RC of Coral Springs Parkland and district 6990 stayed very active as the Int'l committee lead RC, Donating, organizing the Grant support, and recruiting the RC of Downtown Boca Raton to also join the program along with the local DKJA school. A visit held by Hi-Teach Dr. Shefi to the two clubs provided reporting of the previous grant activity and the plans for the next (current) grant. In addition to the generous donation and sustained support from the club the district and the district clubs (The Miami and Weston RC's) the RC of CS/PL serves as the hub and reference club for international clubs joining a and donating to the program.

TRF also held a depth interview with Dr. Susman regarding the RHAW program as an example of a sustainable long-term Global Grant program. The interview held by a TRF professional expert, reflected the program coincidence with three of the TRF focal points namely **Education, Peacebuilding** through cross cultural cooperation, and **Water & Sanitation** through promotion of global public awareness of the challenge and its potential solutions, responding to **PRI Raassin's 2019 call “To take the program to the world”**. The TRF's review was followed by Dr. Sussman interview in the Rotarian magazine.

The **RC's of Willowdale in Canada** (Led by PP Peter Vanek) and **Northeast Sunrise in Philadelphia** (Led by PDG Robert Lankin and spouse **Holly** donated and followed up on the program with in a RC Zoom meeting, As did the **New York RC**. Led by **PDG Hellen Reisler**, Dr. Shefi of Hi-Teach presented an update to the NY RC and PRI Holger Knaack in a virtual meeting where PRI Knaack who knows the RHAW program greeted the club for support of the program. We hope these clubs will recruit local twinning schools in Ney York, Willowdale, Philadelphia and Pennsylvania next year.

Twinning Pilot Activity. Rotary clubs were very active with the twinning pilot. Except for India where the Corona halted schooling, the international activity included:

Romania:

Twinning Activity in Romania is led by **PP Dr. Florin Ilescu** was one of the early adopters of the Twinning Program who was helpful in forming the concept following the district 2490 W&S committee 2016 visit to Romania. **Dr. Ilescu** visited Israel twice, participated in the WATEC 2019 Rotary Meeting and led the activity in Romania spearheading the entire Twinning Program Pilot with four (4) Rotary clubs, the Bistrita RC (PP Ilescu's own club) and three other RC in Romania:

The **Targu Jiu RC** (president Mitrut Costel Dorin) run the Twinning Pilot with two (2) schools from **Targu Jiu: Tudor Vladimirescu College** and **Ecaterina Teodoroiu College**. Both schools examined different water and pollution sources in their region. The **Oradea RC** (president Horia Cartis) led the activity with **Emanuil Gojdu** college studied water saving technics.

The **Iasi Curtea Domneasca RC** (president Viorel Ilescu) led the activity with **EuroEd college**. This school examined and simulated water filtration technics.

Poland:

Twinning Activity was led by four (4) Rotary clubs across Poland with the generous help and mentoring of PDG **Prof. korczyński** collaborating with PP **Shlomo Bronher** of the **Ramle RC** included in the Twinning were

The Torun Rotary club led exceptionally by **Anna Stawikowska** with **Obrowo primary school** where water quality was analyzed in a local lake raising awareness of reduction of water consumption in the community.

The **Lodz RC** run the activity in the Lodz's special school and education center number 3 conducting a project study on rainwater harvesting system for in school use. The **Warszawa and Warszawa Konstancin RC** led the activity in primary school number 1 in Konstancin- Jeziorna and the American airman number 43 schools in Warsaw that focused on water footprint promoting water challenge awareness.

Lithuania:

The activity in Lithuania was also supported by **Prof. korczyński** with help from **Artur Stefnovič** of a local RC in Lithuania. Two schools joined the RHAW Twinning: **Zeimenos gimnaziya**, and **Gimnazum shneyadetzkego** who studied water consumption and pollution awareness in Lithuania.

Kosovo:

The **Pristina RC** under the leadership of **Arben Hoti** and **Dardan Velija** had two (2) schools actively join the program in Kosovo. **Millennium school** (Shkolla "Mileniumi i Tretë") examined the impact of plastic water bottles usage. And **Green school** (Shkolla e Gjelbr) – Studied and promoted water challenge and solution awareness in the community.

Albania:

The **Tirana International RC** supported the activity jointly with the **National Association of Water Utilities in Albania (SHUKALB)** coordinated by PP **Herrie**

Hackman a Rotarian and Water Expert originally from the Nederland, assisted by **Olta Alla** and **Elisabeta Poci**. of SHUKALB successfully working with two schools: **Qemal Stafa school** – where new methods for water filtration and harvesting were investigated, and the Ismail Qemali school – where methods for water conservation and filtration were considered.

India

Rotary club of **Mumbai Queen city** and Rotary Club **Bombay, POWAI** as well as **RC of Bangalore** in India were active and donated, however were not able to recruit schools due to the severe pandemic but expect to be active next year.

13. District 2490 & Haifa Host RC Water Committees

The **2490 District Water & Sanitation** committee headed by **PDG Avner Fuchs** continued to lead and steer the program as part of the WASH activity in the district. It also coordinates the activity with the Haifa host RC. A joint committee was established made up of Haifa RC members and Hi-Teach chaired by PDG Fuchs. A formal collaboration agreement was signed for this purpose following several discussions held during the 2019-20 Rotary year to form the coordination. The day-to-day activity were coordinated during the reporting period with VP Natan Feldman who dedicated endless hours, patience and talent to the program.

Expansion of the activity to a broad international level requires professional dedicated support. It was managed and coordinated by the Hi-Teach team lead by Dr. Shefi and Dr. Ram Naaman with general oversight and support of the Haifa host club, the Twinning Rotary Clubs and broad district participation on both sides as well as ICC committee members. A uniquely formed flexible body of close to 60 people (Rotarians, Teachers and Hi-Teach coaches) around the world working together.

Managing the event required tremendous amount of coordination, rehearsals, project posters and presentation polish and a polished Internet and Zoom management skills. A team of ten 12 skilled Hi-Teach coaches designed produced and managed the event, where even the cyber security aspects were safely guarded. “The proof of the pudding is the eating” and the success of the event and the participants feedback says it all, despite the three cyber disruption attempts which were immediately countered.

The ability to successfully coordinate the overwhelmingly demanding graduation event with hundreds of participants (375), demonstrates the ability of the professional Hi-Teach team to manage coordinate and collaborate with the water committees, District 2490 and the Int'l Districts and the many RC's as well as the Israeli water, education, and municipal authorities. This is an important observation heading forward when the next step following the Twinning Pilot is considered where eventually we expect to have hundreds of partnering Rotary Clubs from around the world.

The district committee continued to be very active and supportive of the program with guiding its activities and recruiting more RC like the Ramle and the Beer-Yaakov RC's, the while VP Natan Feldman helped recruit the Carmel RC and support the activity of the Beer-Sheva club and **PP Menachem Getz** helped connect the Albania and Kosovo districts to the Twinning Pilot, and **PP Bronher** and **PP Z. Meir** of the Ramle RC connected with Poland Lithuania and India.

Haifa RC 2020-19 president **Shlomi Furman** issued an appreciation note to Hi-Teach and Dr. Shefi for the seamless professional conduct of the program praising the long-term commitment, innovation and management of the program and the collaboration with Rotary.

14. Hi-Teach Coaches

Five (5) new Hi-Teach coaches were recruited and are being trained to handle the program growth and the Int'l Twinning Expansion, while two (2) of our past coaches have left. The new recruits are qualified water or environment engineers with education degrees. Four of the team members are employed full time and the rest of the expert team is employed part time. While the professional support is now wider, better balanced and more suited for the role, the associated running cost of the program increase and requires address.

Coaching the new recruits to the special Hi-Teach and RHAW methodology will require some additional time effort and cost. The team now consists of

Dr Amnon Shefi, founder and general manager of Hi-Teach and initiator of the HAW program. Amnon is an experience hi-tech executive, who has been active in education for the last 20 years, following a long career as an executive and R&D leader with varied public and privet industries for 10 years, which followed his retirement as a Captain, after 22 years' service in the Israeli navy where he led major scale R&D program in the underwater world.

Dr. Ram Naaman, a graduating Ph.D. student (Cognitive Sciences, Haifa University) and a tour guide Ram started by coaching the Haifa schools and coordinating the Int'l Twinning Program. Once

Tovi Avraham a water and environment engineer and an experienced teacher of Robotics and Engineering at ***Dargah Begin Technology Demonstration School in Gedera*** where he joined RHAW and the teacher training before joining Hi-Teach to coach new schools. Tovi's experience include water systems at the **Intel Kiryat Gat Fab** (where water is H₂O only!) and developed a modern water filtration apparatus for the leading Israeli maker. Tovi leads robotics First Lego League (FLL) and a Maker Lab, and coaches cross culturally and overseas.

Batool Salman is a science teacher in the Jerusalem area, with M.Sc. in Water & Environment studies from Bir-Ziet university. She leads the Arab and Jewish schools in Jerusalem, and also coaches in the Environmental education "The Green Network" Batool is now works on her Ph.D. research of the impact of environmental education on community behavior.

Dvir Aharon is a science teacher in Ashkelon, completed his Engineering B.Sc. (EE). Dvir coaches' schools in the Ashkelon Ashdod area as a full time Hi-Teach employee. Dvir also heads the electronics and computer development at Hi-Teach where his role is instrumental in forming the new Lego and Robotics based STEAM experimentation kit

Ady Lak a long-time hands-on project support expert. Ady, an ex-submariner holds a practical engineer degree and is a qualified science teacher. Ady now focuses on special projects, Tech school guidance and mostly on sea and environmental education activity.

Tzach Peled Tzachi Shefi provide network support and **Lital Alkalai** help with admin work

Nadav Reich an experienced environmental and ocean biology and education expert joined HT recently. Nadav is experienced young, gifted students coach. He traveled the world and studied in Singapore which will be helpful internationally.

Rachel Sara is a young engineering graduate (Kineret collage) who is also a very experienced coach for various groups including years of highly qualified professional diver guidance. Rachel seeks a long-term carrier as a science coach and joined Hi-Teach full time to coach school in Haifa and the vicinity

Adam Leb holds a B.Sc and M.Sc in water engineering, (Techion) and has served as the water quality engineer at Mekorot the national water utility in Israel. Adam who speaks Arabic and coaches' Galilee schools. Adam also teaches music part time and has been with us for two years now and is well emersed in the methodology, approach, and values we promote. He is well respected by faculty and students alike and leads them to prize winning success projects.

Reuven Ben-Asuli, and **Zafir Hupert** and **Rivka Atiya** were replaced by new recruits and **Tom** and **Malkiel** graduated Med Schools and thus stopped working part time as students.

Chen Marzouk was offered a chief process engineer position in one of the largest desalination plants in Israel a lucrative job offering based in part on her years with Hi-Teach a vote of confidence in RHAW, by now known and respected in the Israeli water industry.

E Mail	Mobile	Last name	First name	#
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1adamleb@gmail.com	972 50-7586801	Leb	Adam	4
dvir.aharon@gmail.com	972 54 7116511	Aharon	Dvir	5
adylak@walla.com	972 52 5852156	Lak	Ady	6
nadavreich@gmail.com	972 52-5659818	Reich	Nadav	7
karam.nuriel@gmail.com	972 52-861-4568	Nuriel	Karam	8
amir.barnea@gmail.com	972 53-6484160	Barnea	Amir	9
amnon@hi-teach.com	972 54 4929093	Shefi	Amnon	10



Management of the coach team

The coach team continues to function as a team distributed over the entire country using weekly management and coordination meetings. The use of Zoom which now became commonplace only made the practice we pioneered, simpler and more accepted. It helped us cope with the Corona pandemic constraints, assisted in overcoming the growing traffic congestion, sets an example for "Green" environmentally sensible operation, and was in concert with the Twinning operation overseas which was conducted virtually over Zoom as well. The convenient ability to record the meetings, enabled absent coaches to catch up by listening to the recordings. The Hi-Teach well established practice, Zoom account and control of the technology was a corner stone of the ability to design plan and conduct the grand virtual graduation event. It was also helpful in guiding and supporting the Rotary W&S committee meetings and was used to update, report and engage Rotary Clubs in the activity.

The key strategy realization and planning this year focused on the Twinning School; Pilot' which ended up being very successful but did require attention, adaptation and challenge resolution.

We continued to improve our operation procedure manual with procedures relating to the Teacher Work plan at school with regards to the STEAM activity. This turned out to be instrumental in the ministry of Education approval of our practices as the basis for the formal teacher's Training. Training the coaches, including introduction for the new coaches, and enhancement and further development of the long time team also benefits from the established successful practice, which now further developed as a result of the broad Int'l exposure

Administrative management of the coaching team, the schools and the partnering organizations has now become a significant task. Supported by our long-time accounting office (Geshe-Rishpi), and a recently added outsource support team (Smarti) to digitally handle payment of salaries, taxes and the associated social benefits, required by law.

15. Administration of the program

The administrative burden of managing the bigger operation has grown significantly. It includes marketing the program to around 100 schools towards the end of the preceding school year, recruitment registration and tailoring of the program to 65 schools, coordination the activity of the schools (including, provisioning of guidance, project support gear, transportation or museum entrance fees for the visiting classes.) developing and conduct of the teacher training plan and new content authoring.

During the last year, the program held over 100 school field tours and around 25 events. These events include teachers training, regional school year launch events for cities with more than 5 participating schools like Haifa, Jerusalem and ZY, and graduation events.

Schools are required to pay a very small annual registration fee (set to assure school commitment). The registration fee allows unlimited use of the program content and services by any number of teachers, classes or students. We discount or waiver the fee when it becomes a challenge to a school that has a demonstrated commitment. Managing the invoicing, discount collection and issuance of receipts is by, itself, a time-consuming burden.

Management of the relationships with the 60-partnering organization, involved authorities and the 22 active Rotary clubs and courting the many other local RC that want to learn about the program on order to join. Numerous meetings (well over 120 annual meetings) are held with partners on content, visits, project planning, and eventual reporting all of this is necessary to support the partnerships especially when financial support is sought.

Running the program, managing the budget, the operations and the human resources function requires an administrative support which will be added to the team next year.

We backed up the e learning content system using a costly intervention by the ISP (internet Service Provider) using an outsource help. It was needed to allow for the planed system upgrade which we did not complete in the reporting period as planned. Luckily, it came in handy when the web site did fail temporarily in the beginning of the year. We therefore constantly back up the content to assure it is not at risk, including appropriate basic cyber protection. We will address the desired upgrade during the 2019 summer vacation in order to be ready for the 2019-20 school year.

16.Partnering and collaborating organizations

The RHAW partner's network was further expanded during the reporting period to includes 75 organizations (!) with 15 new additions over the previous reporting period that included only 60 organizations. The expansion of the network was driven in part by the Int'l Twinning Program, and by the growing connection with the industry, academia and museums.

This is a clear indication of the program vitality and relevance, assuring and supporting the long-term success of the program. The following table lists all 75 organizations with the most recent 15 listed in the third table section. The potential to expand the list much further is reflected for instance by the two Water Utility organizations (In Romania and Albania) as well as by the Museum networks both in Israel and internationally with UNESCO. The picture below shows visitors from the World Bank meeting Hi-Teach team and RHAW students visit to WATEC 2019 in Tel-Aviv. The main part of the list is made up of supporting and collaborating governmental Industry academia and water utilities.

Interfacing with the supporting partners is a proven Hi-Teach skill, but it does require an immense administrative effort of coordination, recognition, content development and financial interaction. Preparation of the visiting classes, safety guidance, research, and project support, and guidance and training of the company's tour guides. This effort will be maintained going forward.

Partners Table The partnering and collaborating organization are listed in the following three-page table. The new partners added in the last one

RHAW - Collaborating Organization Table, 2017-19

#	Organization	Type	Location	contribution
1	Ministry of Economy	Gov.	Jerusalem	Funding, Promotion, Content,
2	Ministry of Education	Gov.	Jerusalem	Curicular guidance, Teacher Training
3	Ministry of Energy & Water	Gov.	Jerusalem	Support, Connection,
4	Ministry of Foreign Affairs	Gov	Jerusalem	Int'l cooperation
5	Bazan	Industry	Haifa	Funding, Content, Visits,
6	Bermad	Industry	Evron	Funding, Content, Visit, Equipment
7	Ein-Shemer Edu Farm	Echo Farm	Ein Shemer	visits to the greenhouse
8	MetzerPlast	Industry	Metzer	Visits
9	Dorad & EZOM	Industry	South	Funding, Content, Visits, Guidance
10	Technion GWRI	University	Haifa	Academic & Lab support, Graduation
11	Hebrew University	University	Jerusalem	Academic support Agro & Policy
12	University of Haifa	University	Haifa	Academic support (aqueduct)
13	Ben Gurion University	University	Sde Boker	Water Research Institute
14	Tel-Aviv University	University	Tel-Aviv	Stockholm Water Prize
15	Azrieli Tech. College	College	Jerusalem	Water quality labs
16	Herzelia Multi Disciplinery	College	Herzelia	Academic, Student coaching pull
17	Kfar Saba water	Water Company	Kfar Saba	Funding, Content wells, rain harvest
18	Hagihon		Jerusalem	cross city water work, funding
19	Shfaram Water		Shfaram	funding, intro to schools
20	Kiryat Gat Water		Kiryat gat	sewage reclamation plant visits
21	Palgy Maim		Izrael Valley	sewage reclamation plant visits
22	Ma'ayanot Darom		Negev	funding, content
23	Herzliya Water		Herzliya	sewage reclamation plant visits
24	Igud Arim Haifa		Haifa	sewage reclamation plant visits
25	Meniv Rishon		Rishon	Content, Activity, Center
26	Mey Carmel		Haifa	Content, visit, funding
27	Mei Cramim		Carmiel	Carmiel water company
28	Vinea Green	Industry	Tirat Carmel	equipment, guidance
29	Nufiltration	Industry	Keisaria	visits to the factory, equipment
30	SES Neulog	Industry	RishonLeZion	equipment, guidance

Collaborating and partnering organizations (Part-1)

RHAW - Collaborating Organization Table, 2017-19 (Cont.)

#	Organization	Type	Location	contribution
31	Dorot	Industry	Dorot	Hydraulic valves, visits.
32	Lachis Agro research	Gov. Lab	Kiryat Gat	Visit, reclaimed water impact
33	Nature & Park authority	Gov.	Israel	Water archeology
34	Nes Ziona, Rehovot,	Museum	Ness Ziona	Antilic Well research project
35	Kfar saba Museum	Museum	Kfar saba	Content, visits, Funding
36	Madatec	Museum	Haifa	Science museum
37	Maccabi Karaso	Company	Tel-Aviv	Wel renewal, Funding
38	Water Authority	Gov.	Tel-Aviv	Guidance, Recognition, Promotion
39	VID	Industry	Ashkelon	Desalination plant visit, Funding
40	Plasson	Industry	Ma'agan Michae	Factory visits
41	SupPlant	Industry	Kfar Yehoshua	Visits, student research, content
42	Naan Dan Jain	Industry	Naan, Dan	Visits, Research equipment
43	Netafim	Industry	Hazerim, Magal	Guidance, visits, Possible support
44	Aqwise	Industry	Herzliya	content
45	Mekorot	Industry	Israel	visits to water work sites
46	Kenes	Company	Israel, Jordan	Watec show - Student visit
47	Globe (NASA, USA, MoE)	Gov	USA, IL, Global	Educational Cooperation
48	WRAP	NGO	USA	Arab colaboration, metrics
49	Mey Daat Water Museum	Edu Center	Beer Sheva	Science activity
50	Beit Miler	Edu Center	Haifa	Center for Twining Program
51	Yeruham Science center	Edu Center	Yeruham	science education outsource
52	Herzliya science center	Edu Center	Herzliya	science education outsource
53	Innovation Africa	NGO	Herzliya, Africa	Edu for Africa, funding assist
54	Eco Peace	NGO	Israel, Jordan	TBD
55	Rotary Debate	Rotary	Int'l debate	2019-20 Debate topic: Water
56	Kando	Industry	Petach Tiqva	visits, content, research
57	GES		Acre	Water treatment experts
58	Haifa Muni	Municipality	Haifa	School participation, Funding
59	Raanana Muni	Municipality	Raanana	School participation, Funding
60	Zichron Yaacov Muni	Municipality	Zichron Yaacov	School participation, Funding

RHAW - Collaborating Organization Table, 2020-21 (Cont.)

#	Organization	Type	Location	contribution
61	Shukalb	Industry	Albania	Support and content
62	Romania water utilities	Industry	Romania	Support and content
63	Bazan Group	Industry	Haifa	Support, Content, Financing
64	Mayanot Haamakim	Water Company	Zichron Yaakov	Support and content
65	Fluence	Industry	Emek Hefer	Support and content
66	Boy's Scout	Education	Israel	Cooperation
67	Water Museums Network UNESCO	Museum org.	Global	Museum cooperation
68	IL Heritage Preservation Society	Museum org.	Israel	STEAM Content support
69	Nt'I Maritime Museum	Museum	Haifa	Man and Sea art competition
70	Mazkeret Batya	Museum	Nes Ziona	Visit, STEAM contnet support
71	Ntn'I Park and Nature	Nat'I Authority	Rehovot Israel	STEAM Content support
72	Immigration & Navy museum	Museum	Haifa	Visit & Study: Maritime & Navel Technology
73	Ashkelon Park	Collage	Ashkelon	Ancieent Well reconstruction
74	Elbit Systems	Industry	Haifa	Maritie Robotic visits
75	Living Green	Industry	Beit Herut	equipment, guidance

Collaborating and partnering organizations (Part-3 the new additions)



Visitors from the World Bank with RHAW team at WATEC 2019 with Dr. Iliescu and Oded Distel

17. Equipment and school support

The program continued to provide books, digital experimentation gear, models, and equipment to the school for use in the research projects and models building, and STEAM work. With more emphasis placed on overall ecological footprint, Energy is naturally becoming very important, and Energy Storage Conversion and Conservation is a subject we try to support with the equipment.

Based on the growing experience we selected the **Lego Education**[®] (A trade name of Lego corporation) product line as a basis since it allows one to build, test and measure quantitatively basic variables of energy such as Current, Voltage, Wattage, elevation, Speed, Force, Moment, Turn Rate etc. We added the long line of standard water related apparatuses such as pumps filters etc. and packaged the entire suite in a STEAM experimental package to which we developed a long line of detailed experiments that apply the water inspired STEAM to valuable curricular value. Following the development by the Hi-Teach R&D group, the entire coach team became involved in development and actual experimentation with the proposed activity done in focused hands-on experimentation sessions during the coach team training days.

Hydroponics and urban agriculture devices and components were also provided since the related subject of advanced agriculture and food security also capture a lot of school's attentions, and were thus provided for, including a robotic component and IoT (Internet of Things) which allow monitoring and control of the system over the internet from far apart.

The experimentation package will be offered to schools and municipalities for purchase and use in the program.

More books were purchased and delivered to coaches and teachers including a recent *It is all EDUCATION* which outlines principles and ideas of future modern education (Like PBL, STEAM and Self-Managed Learning) most of which have been practiced by Hi-Teach for years.

The following tables list the equipment and books provided to schools and the coaches over the reporting two-year period.

RHAW 2020-21 Equipment, Books, (1)	
Neulog	
Comm.	Bluetooth, Wifi controller, USB, RF Link
Controlers	Controller & Display, Battery
Mechanical	Force, Pressure, Motion, force, RPM
Chemical	pH, Salinity, Conductivity, Chloride, Oxygen, Co2, Nitrite, Turbidity
Hydrodynamic	Displacemewnt, Presure
Electrical	Voltage, Current, Multimeters
Temperture	IR Sensor, DigitaSl Thermometer
Aquarium	Aquarium sensors
Lego	Mechanical Lego
	Pneumatic Lego
	Lego Education Mindstorms
	Lego education Renewable energy
	Lego Education Power Function
	General building blocks
General Equipment	Pressure regulator
	Reservoir Hexa Cover
	Carbon, NUF Recycled Dialysis, Disk
Pumps	Windshild wiper pumps, (Set)
	Diaphragm Pump
	Fountain and Air pumps
Filters	Turbine (Gas Steam)
Lab Heaters	Electric, Gas, Temperature
Mechanical Sensors	RPM Sense
	Digital force meter
Adanced Agriculture	Drippers (Pressure compensated)
	Dripper component demo kit
	Presure Regulators
	Supplant test gear
	InfraRed camera
	Aquaponics kit
	Plants, Pots, Soil, Fertilizers
	Water & Fertilizer monitoring gear
	Piping, Connectors

RHAW 2020-21 Equipment, Books, (2)	
Hydroponic	Hydropjonic Kit
	components (Pumps, Pipes, Fertilizer)
Electricity & electronics	Multi testers
	Variable Power Sypply
	Pokit Smart Phone Scope
	Energy Experimentation
Books	Desalination in Israel
	Let there be water (Hebrew)
	Grey Water, Friedler
	Water Resources in Israel, Gvirtzman
	Water in the (Ancient) Tunnel, Zuk
	Everything is EDUCATION
Video	VR 360 Kodack
	Stabilizer
	Video Processing SW
Lego	Lego EV3
	Lego Education
	Power Functon set
	Pneumatic set
	Renewable energy set
	Advanced hydro pump set
	Packaging boxes
Experiment set	Container set
	Trolley cart
Arduino	Arduino Kits
	Water Quality Sensores (EC pH)
	Coomunication module
	Packaging Boxes
	24 V Safe Power Supply
	UPS

Provided equipment and school support

19. Conclusion Summary

We complete an extended two-year GG 2099026 reporting period with more than 50 schools in each one of the two years (2019-20 and 2020-21) and with close to 4,000 students. (1750 in 2020-21). This at the end of sixteen (16) program years with twelve (12) years of Rotary involvement and three (3) global grants, and more than 16,000 students and over two hundred teachers trained (half in Israel and the other half overseas teachers and education executives) over the entire period. We celebrate the program success and recognition as a potentially Global Water & Sanitation education program with a proven record of promotion awareness of the growing Water & Sanitation challenge. A challenge that has grown critical during the program years along with other environmental challenges like global warming and plastic drowning' which we now address as part of an overall ecological foot print topic.

However, Hands Across Water focuses on practical solutions inspiring hope and collaboration recruiting world youth to understand the issue and become part of the solution as they grow up and turn into active and involved citizens. The program offers current relevant multidisciplinary STEAM education building genuine understanding of the issues, and ability to promote valid solutions, all in compliance with classical science curricula such that it can easily be adopted by schools around the world.

The program long term sustainability and continued growth served as launching pad for the International School Twinning Pilot successfully run with fifteen (15) schools in six (6) countries around the world during the reporting period overcoming the Corona virus and its associated school year challenges. The positive formal feedback analysis clearly indicates that the RHAW Twinning Program can become the answer to a strong emerging need for:

- (1) Relevant STEAM education appealing to students, schools, and educators.
- (2) Address of Water & Sanitation and environmental challenge and solutions.
- (3) Clear direct relevance to classical science curricula
- (4) Attractive international cross-cultural collaboration.
- (5) Rotary connection with Water Utilities, Industry, and Academia
- (6) Adaptable Government, Municipalities, and local regulations
- (7) Distributed, scalable and affordable implementation

The unique peacebuilding collaboration inherent in the program was demonstrated during the reporting period through the continued cross sector collaboration that continued in the face of growing general conflict and tension. Joint cross sector teams cooperated with twinning school taking pride in their joint collaborative work. This important feature of the program is further emphasized by plans of many of the participating schools to the collaboration next year. Some of our partnering program like WRAP and Eco Peace continue their parallel collaborative work, and together the subtle impact is noticed and inspires hope.

Engaging students in the study of sciences is a challenge in today's accelerating knowledge era. The unique combination of the subjects with relevant STEAM, and Environmental challenges, along with the inherent excitement of international collaboration brings a fresh educational approach. Engagement seized from being a challenge. Guiding and training the teachers is becoming one. The unique **Teacher Training** and Support approach addresses the challenge. It was developed by a lot of trials and many errors over the last 22 years, but judging from teacher's feedback, it does seem to be a valid appealing approach. The approach is repeatedly validated, and it enjoys a growing vote of confidence from the rigorously controlling authority of the ministry of education that grants approval for the RHAW teacher training for the third year now

Collaboration with the water & sanitation utilities provided by RHAW is unique. It enables communication with the community the utilities serve. This was repeatedly demonstrated over the years, and again last year when with the Jerusalem water & sanitation utility (HaGihon) in the UmTuba. A new sewage system was designed to replace the septic tanks used in the past posing a sanitary risk to the village population. The project was met with public rejection due to lack of knowledge and trust. At the school's Master's Muhamad Abu Tier's request the school students studied the subject of waste water, based on content developed by Hi-Teach using information provided by the utility (A longtime supporter of the RHAW program). A program manager from the utility then came to the school, met the students and their and provided the explanation and answered their questions, allowing the project implementation to the mutual satisfaction of the community, the utility, the student, and... PP Shlomo Hayat of the Jerusalem RC (the district oldest RC over 90 years old), who as an architect designed the beautiful new Um Tuba school



Giora Shacham, director of the Israeli Water Authority address the large 2019 graduation event audience at the Technion GWRI, praising the RHAW program as the world water supply becomes more dependent on technology

20. Gratitude & Credit

On behalf of the students and 100 educators that benefited from the Phase-III RHAW program in the two-school year period of 2019-21 it helped support and the diverse communities they represent, and their shared interest to jointly address the growing water & sanitation challenge, **we would like to convey our gratitude to the program initiators, supporters, partners, and facilitators.**

To **District 2490 and governor PDG Maty Harel, Dr. Nahum Frenkel and DG Haim Kennet**, and to the district Water & sanitation committee led by chairman **PDG Avner Fuchs**. To the Haifa Rotary host club and its eight consecutive presidents who have been supportive, and to the many participating local Rotary clubs of Zichron-Yaacov, Gedera, Kiryat-Gat, Carmiel, Tel-Aviv Jaffa, Jaffa, Holon, Beer-Sheva, Nesher, Hedera, Jerusalem, Kfar Saba, Beer Yaakov, Ashkelon, Ashdod, Carmel, Herzelia, Mazkeret Batiya, and Lod.

To the **Coral Springs/Parkland Int'l partner RC** and the supportive **district 6990**, led by **PP Dr. Gerald Sussman**, who leads one of the largest groups of active and supportive international partners including the Boca Raton Downtown RC and Brendan McGinnis (co-founder of WRAP). To the RC's of Washington DC, New York, Weston, Miami, Lexington Sunrise, NE Sunrise Philadelphia, Willowdale, and the Twinning School Partners in Romania Poland Lithuania, Albania, Kosovo and India

To **The Rotary Fund (TRF)**, its officers and the professional Cadre reviewer **Dr. Simona Pinton**, for the financial, organizational, and professional support in the development and execution of the sustainable program. To **PRI Rassin and PRI Knaack**

And to the very long list of local program partners in the industry, academia, and government and water utilities around the world, and the WATEC organization

We are proud of our mutual achievements in the address of the water & sanitation challenge, And the joint education of diverse sectors of society that promotes awareness of the water challenges along with peace and collaboration. The modern education program brings value to the schools, which together with the broad partnership assures its long-term sustainability. Our plan to extend the program with school around the world now offers a potential to increase awareness of youth around the world to the water challenge & possible collaborative solutions.

Written for the Haifa RC

Host of Phase-II RHAW

Global Grant 2099026

By

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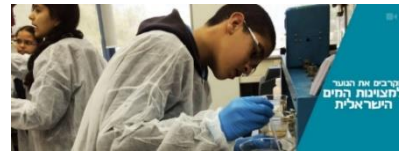
Reviewd and approved by: Haifa RC VP Nathan Feldman, the district 2490 W&S Committee Chair PDG Avner Fuchs, int'l Committee Chair PP Dr. Gerald Sussman.

21.Reference links (Click the title of the picture)

[The Hi-Teach web site](#)



[Program Facebook](#)



[RHAW web site](#)



[Program video clip](#)



[2017-18 Graduation](#)



[2018-19 School year activity](#)

[2018-19 Graduation](#)



[2019-20 Virtual Graduation](#)



22.Tables

Invoice Summary, followed by 1st, 2nd and 3rd detailed invoices.

Hands Across Water Phase III with School Twinning Program							Local Currency		Hi-Teach invoices (KILS w/VAT)			Hi-Teach total %
26.7.21 Budget (\$K)							K (ILS)		1st	2nd	3rd	
Program Planned Budget (K\$)							Plan	Actual				
							3.6	3.2	41%	26%	16%	83%
							ILS/\$	Act/Pln				
							1	0.9				
#	Phase III school support items	Supplier	Unit Cost (Avg. K\$)	Qty	Total	21%	Phase III school support items					
1	School Specific STEAM activity, provision & adaptation	Water, Agro consult, Hi-Teach,	0.36	15	5.44	4%	19.6	17.4	10	6	1.41	
2	In school Teacher's training and guidance	Hi-Teach or hired by HT, Travel	0.73	15	10.88	8%	39.2	34.8	24	8	2.82	
3	Collaboration support (Travel, Communication, Instagram)	Transport & other providers	0.18	15	2.72	2%	9.8	8.7	3.5	3.5		
4	Models, Lab equipment, Greenhouses, Irrigation equip	SES, Lego, Globe	0.18	15	2.72	2%	9.8	8.7	5	3		
5	School graduation event support (posters, travel)	Technion, Hi-Teach	0.18	15	2.72	2%	9.8	8.7	3.5	2	1.00	
6	Education centers support	Hi-Teach, Miller house,	0.27	15	4.08	3%	14.7	13.1	2.5	2	3.00	
Sub total School Specific activities					28.56	21%	102.8	91.4	48.50	24.50	8.22	89%
#	Phase II+I school support	Supplier	Unit Cost (Avg. K\$)	Qty	Total	18%	Phase II+I school support					
7	Content, Teacher Training and guidance	Hi-Teach in school	0.68	24	16.32	12%	58.8	52.2	21	14.00	10.00	
8	Model, Lab Equipment, Greenhouse, Irrigation, Hydroponics	SES, Lego, Hi-Teach	0.08	24	1.836	1.35%	6.6	5.9	3	2.50	0.38	
32	Collab. Peer coaching, Grad event support	Eged, Hi-Teach	0.06	24	1.36	1%	4.9	4.4	2	1.50	0.85	
9	Young Speaker support & Debate	Hi-Teach	0.18	15	2.72	2%	9.8	8.7				
10	Low Income school support	Hi-Teach	0.54	5	2.72	2%	9.8	8.7	3	1.00		
Sub Total Phase I+II School activity					24.956	18%	89.8	79.9	29.0	19.0	11.2	74%
#	Twinning School	Supplier	Unit Cost (Avg. K\$)	Qty	Total	14%	Twinning School					
11	Pilot program outline content, Web presence		1.36	1	1.36	1%	4.9	4.4	3	1.00	0.00	
12	Program promotion, Web site		2.72	1	2.72	2%	9.8	8.7	3.5	1.00	0.00	
13	Twinning RC guidance	Hi-Teach	1.36	1	1.36	1%	4.9	4.4	2	1.00	1.00	
14	Twinning school teacher & Project guidance		0.23	12	2.72	2%	9.8	8.7	3.5	2.00	3.00	
15	Plastic Free Ocean & Sea with the IYFR content dev.		2.72	1	2.72	2%	9.8	8.7	1			
16	Communication & interaction support (zoom)	Com provider	0.34	12	4.08	3%	14.7	13.1	5	2.00		
17	Integration into graduation & Twinning coordination	Hi-Teach	0.23	12	2.72	2%	9.8	8.7	3.5	2.00	1.00	
	Assistance in recruit local support	Hi-Teach, RC					0.0	0.0	1	1.00	1.00	
18	General content translation (English, Spanish)	Hi-Teach	0.68	2	1.36	1%	4.9	4.4	1.5	1.00		
Sub Total Twinning School activity					19.04	14%	68.5	60.9	24.0	11.0	6.0	67%
#	Program Central Activity	Supplier	Unit Cost (Avg. K\$)	Qty	Total	35%	Program Central Activity					
19	Translation to Arabic (Chapter contents)	Hi-Teach, Technion	0.45	3	1.36	1%	4.9	4.4	1.50	1.50		
31	Corona Virus content development	Hi-Teach, Viral experts		1	5.44	4%	19.6	17.4	7.00	5.00	4.00	
20	New content dev. Sustainability STEAM Rev Eng	Hi-Teach, Technion, Ady Lak	1.36	4	5.44	4%	19.6	17.4	7.00	4.00	6.30	
21	STEAM models development	Hi-Teach	3.40	2	6.8	5%	24.5	21.8	7.00	6.53	8.23	
22	Teacher's STEAM training - Central - Regional	Hi-Teach, Technion, Bermad	2.72	2	5.44	4%	19.6	17.4	7.00	5.00	4.00	
23	Teacher's Award	Hi-Teach to selected teachers	0.68	2	1.36	1%	4.9	4.4	1.50	1.00	2.00	
24	E Learning system BU, Improvements & Hosting	Hi-Teach, Tzach - Peled, Tom	4.08	1	4.08	3%	14.7	13.1	5.00	5.00	4.00	
25	Communication Travel and Video conf. services	Hi-Teach	5.44	1	5.44	4%	19.6	17.4	7.00	5.00	5.00	
26	Recruit and train program coaches	Technion, BG Unj, HUJI, Hi-Teach	1.36	2	2.72	2%	9.8	8.7	5.00	2.00	1.00	
27	Data Collection, Accounting review, Rpt. & Eval	Hi-Teach, Haifa RC Accountant	4.08	1	4.08	3%	14.7	13.1	0.00	0.00	0.00	
28	Collaboration Coordinator, Insurance	TBD	2.72	1	2.72	2%	9.8	8.7	4.00	3.00	2.00	
29	Contingency and TBD	TBD	2.80	1	2.8016	2.06%	10.1	9.0	3.50	3.50		
Sub Total Program Central Activity					47.6816	35%	171.7	152.6	55.5	41.5	36.5	88%
37	Management	Dr. Amnon Shefi			13.3	10%	48	42.5	18.50	14.00	8.50	96%
Total					133.53	98%	480.7	427.3	175.5	110.0	70.5	83%
Total W/O VAT									150	94	60.2	
									Total w vat		356.0	
									Total w/o vat		304.3	

1st invoice

Hands Across Water Phase III with School Twinning Program				1st Invoice
21.2.21 Budget (\$K)				KIIS
Program Planned Budget (K\$)				Act wVAT
				41%
				בפעל
#	Phase III school support Items	Supplier	Total	
1	School Specific STEAM activity, provision & adaptation	Water, Agro consult, Hi-Teach,	5.44	10
2	In school Teacher's training and guidance	Hi-Teach or hired by HT, Travel	10.88	24
3	Collaboration support (Travel, Communication, Internet)	Transport & other providers	2.72	3.5
4	Models, Lab equipment, Greenhouses, Irrigation equip.	SES, Lego, Globe	2.72	5
5	School graduation event support (posters, travel)	Technion, Hi-Teach	2.72	3.5
6	Education centers support	Hi-Teach, Miller house,	4.08	2.5
Sub total School Specific activities			28.56	48.50
#	Phase II+I school support	Supplier	Total	
7	Content, Teacher Training and guidance	Hi-Teach in school	16.32	21
8	Model, Lab Equipment, Greenhouse, Irrigation, Hydropho	SES, Lego, Hi-Teach	1.836	3
32	Collab. Peer coaching, Grad event support	Eged, Hi-Teach	1.36	2
9	Young Speaker support	Hi-Teach	2.72	0
10	Low Income school support	Hi-Teach	2.72	3
Sub Total Phase I+II School activity			24.956	29.0
#	Twinning School	Supplier	Total	
11	Pilot program outline content, Web presence	Hi-Teach	1.36	3
12	Program promotion, Web site		2.72	3.5
13	Twinning RC guidance		1.36	2
14	Twinning school teacher & Project guidance		2.72	3.5
15	Plastic Free Ocean & Sea with the IVFR content dev.		2.72	1
16	Communication & interaction support (zoom)	Com provider	4.08	5
17	Integration into graduation & Twinning coordination	Hi-Teach	2.72	3.5
	Assistance in recruit local support	Hi-Teach, RC		1
18	General content translation (English, Spanish)	Hi-Teach	1.36	1.5
Sub Total Twinning School activity			19.04	24.0
#	Program Central Activity	Supplier	Total	
19	Translation to Arabic (Chapter contents)	Hi-Teach, Technion	1.36	1.50
31	Corona Virus content development	Hi-Teach, Viral experts	5.44	7.00
20	New content dev. Sustainability STEAM Rev Eng	Hi-Teach, Technion, Ady Lak	5.44	7.00
21	STEAM models development	Hi-Teach	6.8	7.00
22	Teacher's STEAM training - Central - Regional	Hi-Teach, Technion, Bermad	5.44	7.00
23	Teacher's Award	Hi-Teach to selected teachers	1.36	1.50
24	E Learning system BU, Improvements & Hosting	Hi-Teach, Tzach - Peled, Tom	4.08	5.00
25	Communication Travel and Video conf. services	Hi-Teach	5.44	7.00
26	Recruit and train program coaches	Technion, BG Uni, HUJI, Hi-Teach	2.72	5.00
27	Data Collection, Accounting review, Rpt. & Eval	Hi-Teach, Haifa RC Accountant	4.08	0.00
28	Colaboration Coordinator, Insurance	TBD	2.72	4.00
29	Contingency and TBD	TBD	2.8016	3.50
Sub Total Program Central Activity			47.6816	55.5
37	Management	Dr. Amnon Shefi	13.3	18.50
Total			133.53	175.5
Total W/O VAT				150

2nd Invoice

Hands Across Water Phase III with School Twinning Program						2nd Invoice (KILS)
5.4.21 Budget (\$K)					Act wVAT	
Program Planed Budget (K\$)						26% במטל
#	Phase III school support Items	Supplier	Unit Cost (Avg. K\$)	Qty	Total	
1	School Specific STEAM activity, provision & adaptation	Water, Agro consult, Hi-Teach,	0.36	15	5.44	6
2	In school Teacher's training and guidance	Hi-Teach or hired by HT, Travel	0.73	15	10.88	8
3	Collaboration support (Travel, Communication, Internet)	Transport & other providers	0.18	15	2.72	3.5
4	Models, Lab equipment, Greenhouses, Irrigation equip.	SES, Lego, Globe	0.18	15	2.72	3
5	School graduation event support (posters, travel)	Technion, Hi-Teach	0.18	15	2.72	2
6	Education centers support	Hi-Teach, Miller house,	0.27	15	4.08	2
Sub total School Specific activities					28.56	24.50
#	Phase II+I school support	Supplier	Unit Cost (Avg. K\$)	Qty	Total	
7	Content, Teacher Training and guidance	Hi-Teach in school	0.68	24	16.32	14.00
8	Model, Lab Equipment, Greenhouse, Irrigation, Hydropho	SES, Lego, Hi-Teach	0.08	24	1.836	2.50
32	Collab. Peer coaching, Grad event support	Eged, Hi-Teach	0.06	24	1.36	1.50
9	Young Speaker support	Hi-Teach	0.18	15	2.72	
10	Low Income school support	Hi-Teach	0.54	5	2.72	1.00
Sub Total Phase I-II School activity					24.956	19.0
#	Twinning School	Supplier	Unit Cost (Avg. K\$)	Qty	Total	
11	Pilot program outline content, Web presence	Hi-Teach	1.36	1	1.36	1.00
12	Program promotion, Web site		2.72	1	2.72	1.00
13	Twinning RC guidance		1.36	1	1.36	1.00
14	Twinning school teacher & Project guidance		0.23	12	2.72	2.00
15	Plastic Free Ocean & Sea with the IVFR content dev.		2.72	1	2.72	
16	Communication & interaction support (zoom)	Com provider	0.34	12	4.08	2.00
17	Integration into graduation & Twinning coordination	Hi-Teach	0.23	12	2.72	2.00
	Assitance in recruite local support	Hi-Teach, RC				1.00
18	General content translation (English, Spanish)	Hi-Teach	0.68	2	1.36	1.00
Sub Total Twinning School activity					19.04	11.0
#	Program Central Activity	Supplier	Unit Cost (Avg. K\$)	Qty	Total	
19	Translation to Arabic (Chapter contents)	Hi-Teach, Technion	0.45	3	1.36	1.50
31	Corona Virus content development	Hi-Teach, Viral experts		1	5.44	5.00
20	New content dev. Sustainability STEAM Rev Eng	Hi-Teach, Technion, Ady Lak	1.36	4	5.44	4.00
21	STEAM models development	Hi-Teach	3.40	2	6.8	6.53
22	Teacher's STEAM training - Central - Regional	Hi-Teach, Technion, Bermad	2.72	2	5.44	5.00
23	Teacher's Award	Hi-Teach to selected teachers	0.68	2	1.36	1.00
24	E Learning system BU, Improvements & Hosting	Hi-Teach, Tzach - Peled, Tom	4.08	1	4.08	5.00
25	Communication Travel and Video conf. services	Hi-Teach	5.44	1	5.44	5.00
26	Recruit and train program coaches	Technion, BG Uni, HUJI, Hi-Teach	1.36	2	2.72	2.00
27	Data Collection, Accounting review, Rpt. & Eval	Hi-Teach, Haifa RC Accountant	4.08	1	4.08	0.00
28	Collaboration Coordinator, Insurance	TBD	2.72	1	2.72	3.00
29	Contingency and TBD	TBD	2.80	1	2.8016	3.50
Sub Total Program Central Activity					47.6816	41.5
37	Management	Dr. Amnon Shefi			13.3	14.00
Total					133.53	110.0
Total W/O VAT						94.04

3rd Invoice

Hands Across Water Phase III with School Twinning Program						3rd Invoice 2023
28.6.21 Budget (\$K)					Act wVAT	
Program Planned Budget (K\$)						16% בפועל
#	Phase III school support Items	Supplier	Unit Cost (Avg. K\$)	Qty	Total	
1	School Specific STEAM activity, provision & adaptation	Water, Agro consult, Hi-Teach,	0.36	15	5.44	1.41
2	In school Teacher's training and guidance	Hi-Teach or hired by HT, Travel	0.73	15	10.88	2.82
3	Collaboration support (Travel, Communication, Internet)	Transport & other providers	0.18	15	2.72	
4	Models, Lab equipment, Greenhouses, Irrigation equip.	SES, Lego, Globe	0.18	15	2.72	
5	School graduation event support (posters, travel)	Technion, Hi-Teach	0.18	15	2.72	1.00
6	Education centers support	Hi-Teach, Miller house,	0.27	15	4.08	3.00
Sub total School Specific activities					28.56	8.22
#	Phase II+I school support	Supplier	Unit Cost (Avg. K\$)	Qty	Total	
7	Content, Teacher Training and guidance	Hi-Teach in school	0.68	24	16.32	10.00
8	Model, Lab Equipment, Greenhouse, Irrigation, Hydropho	SES, Lego, Hi-Teach	0.08	24	1.836	0.38
32	Collab. Peer coaching, Grad event support	Eged, Hi-Teach	0.06	24	1.36	0.85
9	Young Speaker support & Debate	Hi-Teach	0.18	15	2.72	
10	Low Income school support	Hi-Teach	0.54	5	2.72	
Sub Total Phase I+II School activity					24.956	11.2
#	Twinning School	Supplier	Unit Cost (Avg. K\$)	Qty	Total	
11	Pilot program outline content, Web presence	Hi-Teach	1.36	1	1.36	0.00
12	Program promotion, Web site		2.72	1	2.72	0.00
13	Twinning RC guidance		1.36	1	1.36	1.00
14	Twinning school teacher & Project guidance		0.23	12	2.72	3.00
15	Plastic Free Ocean & Sea with the IYFR content dev.		2.72	1	2.72	
16	Communication & interaction support (zoom)	Com provider	0.34	12	4.08	
17	Integration into graduation & Twinning coordination	Hi-Teach	0.23	12	2.72	1.00
	Assistance in recruit local support	Hi-Teach, RC				1.00
18	General content translation (English, Spanish)	Hi-Teach	0.68	2	1.36	
Sub Total Twinning School activity					19.04	6.0
#	Program Central Activity	Supplier	Unit Cost (Avg. K\$)	Qty	Total	
19	Translation to Arabic (Chapter contents)	Hi-Teach, Technion	0.45	3	1.36	
31	Corona Virus content development	Hi-Teach, Viral experts		1	5.44	4.00
20	New content dev. Sustainability STEAM Rev Eng	Hi-Teach, Technion, Ady Lak	1.36	4	5.44	6.30
21	STEAM models development	Hi-Teach	3.40	2	6.8	8.23
22	Teacher's STEAM training - Central - Regional	Hi-Teach, Technion, Bermad	2.72	2	5.44	4.00
23	Teacher's Award	Hi-Teach to selected teachers	0.68	2	1.36	2.00
24	E Learning system BU, Improvements & Hosting	Hi-Teach, Tzach - Peled, Tom	4.08	1	4.08	4.00
25	Communication Travel and Video conf. services	Hi-Teach	5.44	1	5.44	5.00
26	Recruit and train program coaches	Technion, BG Uni, HUJI, Hi-Teach	1.36	2	2.72	1.00
27	Data Collection, Accounting review, Rpt. & Eval	Hi-Teach, Haifa RC Accountant	4.08	1	4.08	0.00
28	Collaboration Coordinator, Insurance	TBD	2.72	1	2.72	2.00
29	Contingency and TBD	TBD	2.80	1	2.8016	
Sub Total Program Central Activity					47.6816	36.5
37	Management	Dr. Amnon Shefi			13.3	8.50
Total					133.53	70.5
Total W/O VAT						60.24

Haifa Informal Education activities financial report

App #	RHAW informal education activities in Haifa - Financial report	Actual
	The RHAW actual activities and expenses was according with budget plan, which fulfill nice and productively. Hereunder details can be found:	
6	6 - Operations Phase 3 Education centers Hi-Teach, Miller house, ₪ 6598 \$1833, Actual - 6500 NIS	6500
9	9 - Operations Phase 1+2 schools Young Speakers on Water Selected by Haifa & Local RC's ₪ 9800 \$2722 Actual Debate – 8000 NIS	8000
10	10 - Operations Phase 1+2 Low income school support Hi-Teach or hired by Haifa RC ₪ 9800 \$2722 Actual Beit Miler – 6500 NIS	6500
11	11 - Operations STP Pilot outline content & web presence Hi-Teach, Haifa RC ₪ 4900 \$1361 Actual – done by Hi-Teach	
12	12 - Operations STP Program promotion in coordination with Hi-teach Marketing support hired by Haifa RC ₪ 9800 \$2722 Actual – Art collage for logo development support – 4000 NIS	4000
15	15 - Operations STP Plastic free oceans & sea with IYFR content development Hired by Haifa RC ₪ 17899 \$4972 Actual - Sea Scouts - 16000 NIS	16000
16	16 - Operations STP Youth interaction & Communication support Exchange, Zoom Miller house, RC ₪ 14700 \$4083 Actual – Makers – 13000 NIS	13000
27	27 - Monitoring/evaluation Data collection accounting Hi-Teach, Haifa RC accountant ₪ 14700 \$4083 Actual – monitoring & Accounting - 13,000+VAT=15,210 NIS	15210
	Total	69,210
Inv 11.4.21	NIS Plastic free (sea scouts), Beit Miler – Education program & Multi culture seminar 29,000	29,000
Inv 2.6.21	(9360+5850+15,210) INV 2.6.21 Beit Miler - Makers, Monitoring	28,210
Inv 2.6.21	INV 2.6.21 8000 NIS Beit Miler – Debate seminar	8,000
Inv 30.8.21	INV30.8.21 4000 NIS logo development (Art Collage Tiltan inv 2110579)	4,000
	Total	69210

Bank record report Summary

	Debit	Projet Expenses	Credit	
Total	430,270	422,981	432,472	
Closing Balance	2,464	2,464	283	Opening balance
Total		425,445		
Bank Fees		7,289		
Grand Total	432,733	432,733	432,755	Grand Total

Schools in Israel 2020-21

School Name	Town
Surkis	Kfar Saba
Ytuvaly Habsor	Eshkol
Nitz ani Eshkol	Eshkol
Regavim	Beer Tuvia
Rimonim	Ashdod
Hahita	Zichron Yaacov
Nili	Zichron Yaacov
HaHoresh	Zichron Yaacov
Furadis	Furadis
Darcha Beqin	Gedera
Ziler	Beer Sheva
Beit Ariel	Beer Sheva
Alliance	Haifa
Snt. Michael	Jaffa
A Tur	Jerusalem
Mekif D	Ashkelon
Mekif A	Ashkelon
Mekif V	Ashkelon
Ort Afridar	Ashkelon
EI Karma	Haifa
Ahmadia	Haifa
Ironi G	Haifa
Hareali Matos	Haifa
Camal Eben Amdur	Sachnin
El Chilan	Sachnin
Tahha	Sachnin
Shaeb	Shaeb
Um Tuba, Boys	E Jerusalem
Um Tuba Girls	E Jerusalem
Arie Meir	Kiryat Gat
Ibrahim Iben Husain Mekif G	Shfaram
Gifted	Herz elia
Keshet	Maz keret Batya
Rabin BW	Maz keret batiya
Hamoshava	Zichron Yaacovb
Yoana Jabutinski	Beer Yaacov
Yeshiva HS	Zichron Yaacov
Pelech	Zichron Yaacov
Haklai	Pardes Hana
Gvanim	Eylat
Rabin	Eylat
GoldWater	Eylat
Shoham HS	Shoham
Ort Oranit	Oranit
Beit Ekstien	Petach Tikva
Abdalla Ben Husain	Shik Jarach, E Jerusalem
Tsur Baher	E Jerusalem
Sharet	Kfar saba
Rabin	Kfar Saba
Eytan	Kibuts Naan
Beit Miller	Haifa
Amit, Ironi 6	Haifa
Bosmat	Haifa
Ein Hayam	Haifa
Matach	Tveria (Tayberries)

Pilot Twinning Schools by country

2020-21 RHAW Twinning Pilot Schools					
Romania	Poland	Lithuania	Albania	Kosovo	USA
EuroEd College Iasi	Specjalny Ośrodek Szkolno-Wychowawczy	.Švenčionių r Pabradės Žeimenos gimnazija	Ismail Qemali	Shkolla e Gjelbr	DKJA Donna Klein- FL
Emanuil Gojdu Clg. Oradea	Liceum Ogólnokształcące Niepubliczne	Gimnazjum im.J.Sniadeckiego	Qemal Stafa	Mileniumi i Tretë	
Ecaterina Teodoroiu College Targu Jiu	Obrowo primary				
Tudor Vladimirescu College Targu Jiu	Szkoła Podstawowa				

Beneficiaries (See budget plan)			
		Plan	Actual
Direct Beneficiaries			
Average Classes per school		1.5	1
Students in a class		35	35
Direct schools Phase I		7	
Direct schools Phase II		5	
Direct Schools Phase III			35
Twining schools		2	15
Total schools		14	50
Direct Beneficiaries		735	1750
Direct Beneficiaries estimate			
Average Classes per school		1.5	
Students in a class		35	
In direct schools		8	
Indirect Beneficiaries		420	250
Total Direct and Indirect		1155	2000
2019-20 school year students			2200
Two year (2019-21) total		1155	4200

RHAH Phasae - III 2019-21

שנה חודש	2019												2020												2021											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
#	פעילות																																			
1	Last pay GG Phase II																																			
2	Year end event 2019-20																																			
3	Report GG1640670 Phase II																																			
4	Report GG1640670 Approved																																			
5	PRI Rassin visit																																			
6	Haifa RC to host phase III																																			
7	Wstec 2019: School Twinning idea																																			
8	Water committee (District & Haifa)																																			
9	Global Grant 200026 Phase-III Plan																																			
10	US Rotary Clubs tour																																			
11	Participating districts DDF approval																																			
12	GG2099026 Phase-III application																																			
13	TRF discussions																																			
14	GG2099026 Phase-III approved																																			
15	Donation collection																																			
16	Donation transfer to TRF																																			
17	Content developement launched																																			
18	New coaches recruite																																			
19	Schools summary & feedback talks																																			
20	Summer teachers training																																			
21	School recruitment phase-III																																			
22	Program lainch calls with schools																																			
23	Content dev (VR tours, STEAM)																																			
24	Environment & Corona course dev																																			
25	Experiment package (Lego +)																																			
26	Twinning School content dev.																																			
27	Twinning RC & Schools recruitment																																			
28	Donation collection completion																																			
29	Budget avaiable																																			
30	Program execution																																			
31	Yearend event preperation																																			
32	Report (Data collect, analyze, rprt)																																			
33	Schools summary & feedback talks																																			
34	Preperation for Phase-IV																																			

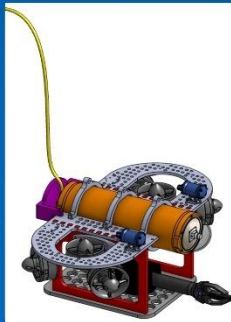
23. Abbreviations

BS	Beer-Sheva
CCC	Cross Cultural Collaboration
CS/PL	Coral Springs / Parkland
CCGS	Combined cycle gas Steam
HAW	Hands Across waters
HT	Hi-Teach
HS	High School
MS	Middle School
ES	Elementary School
IPR	Interim Progress Report
JHS	Junior High School
NWPR	Noteworthy Project Recognition
IPR	Interim Progress Report
ISP	Internet Service Provider
GWRI	Grand Water Research institute
MB	Mazkeret-Batya
MoE	Ministry of Education
MoFA	Ministry of Foreign Affairs
Mol&W	Ministry of Infrastructure (Water & energy)
MOOC	Massive Online Open Course
Moodle	An e learning open-source universal platform
NWPR	Noteworthy Project Recognition
PP	Past President
PRI	Past President Rotary International
PDG	Past District Governor
RC	Rotary Club
RHAW	Rotary Hands Across Waters
STP	School Twinning Program
SES	Scientific Education Systems
STP	School Twinning Pilot
STEAM	Science Technology Engineering Art math
TRF	The Rotary Fund
TSBS	Twinning Side By Side
WASRAG	Water and Sanitation Rotary Action Group
W&SI	Water and Sanitation Inspired
W&S	Water and Sanitation
WASH	Water Sanitation and Hygiene
AFFHUR	Agricultural and Food faculty Hebrew University Rehovot
W&ST	Water & Sanitation Trustee
W&S	Water and Sanitation
W&SC	Water and Sanitation Committee
ZY RC	Zichron Yaacov Rotary Club

24. Pictures



Figure 6 Sea Scout Sail : Keep the sea clean. For more see Haifa informal education chapter



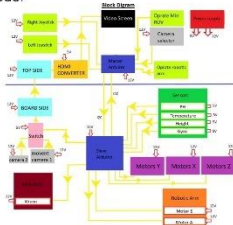
Product testing and suggestions for improvement

Our ROV's control system isn't as comfortable as it can be. In addition, The machine cannot operate without being connected with a wire to the control system.

אורט ישראל
מגמת מכטרוניקה אורט אבין
ה-טי"ז

Product construction documentation

We separated ourselves into 4 groups in order to work on the project with more efficiency, the first group worked on the ROV's structure, the second group worked on the robotic arm, the third group worked on the electrical circuits and the fourth group worked on the code.



Testing and developing the video system

Choosing solution

We chose to create an ROV that will be able to scan the environment, and with the ROV we can take samples from the water and the seabed with our robotic arm that is attached to the ROV.

Design of the chosen solution

Tests results and experiment

Before we started to develop the project, we did some experiments with Archimedes law.

The other experiments was about how we set the ROV at specific depth.

Designing

The ROV has 6 T-100 engines, 4 of which move the ROV side to side forward and backwards and 2 up and down. It has sensors such as a temp sensor, PH sensor and pressure sensor, the ROV has two cameras. The ROV also has a robotic claw and a mini ROV. The ROV control is based on I2C communication between on and under the water.

Problem and requirements

Due to the behavior of humankind, many water bodies were harmed and got polluted therefore we had to produce a solution in order to reduce the pollution level of the water bodies and maybe even purify and restore them to their natural state. By doing that we will be able to save the water creatures and our water supply. Our solution is to build a robot (submarine) that will be able to operate in water, detect and clean the water bodies, and help the coral reefs to recover.

Technological, scientific, social background

We are studying in a High-Tech school where we are exposed to machines and technology.

For designing and building this ROV we learn about the marine world in many aspects: chemistry, physics, submarines operation, water pollution, object behavior under the water, and the effect of climate change. In Israel water and the sea has always been an issue, Israel is 60% desert so 80% of Israel tap water are originally from the sea and most of the water is recycled for agriculture use.

thus, saving water is part of our cultural.

כלל תלמידי מגמת מכטרוניקה
משכבת י"ב אורט אבין

מעורבים בתכנון
הפריקט:

יצחק פונטוש

צביה גדנר

אורי כהן

מורה/ים:

Program expanding



Rotary Club activity increased and next were RC from Poland led by PDG Prof. Marian Jerzy Korczynski and PP Shlomo Bronher of the Lodz and Ramle RC

**Visitors from the World Bank
impressed by the working students**



Florin, Amnon and Oded discuss
RHAW Twinning Program
with guests from the World Bank



Hi-Teach 2020

Rotary Hands Across Water

Poland



Rotary Hands Across Water
School Twinning Program

PDG past DRFC Prof Marian Jerzy Korczynski Lodze RC leads,
Four schools Fully engaged; Lithuania added with 2 schools
Special Education school added

Rotary Hands Across Water

Romania



2017 District 2490 Water & Sanitation committee visit

Interest expressed

Dr. Florin Iliescu, a water experts leads

Basic water & sanitation program launched

Dr. Iliescu visits WATEC 2019

Twinning Program configured

Four RC recruited, Join the Global Grant

2020 Pilot launched

STEAM work launched

Twining activity is underway

Logo competition

Rotary Hands Across Water

VP RI Babalola visit Begin school, Gedera



Student impression:
“We learned we can understand things...”

Rotary Hands Across Water

PRI Barry RassinAddress

RHAW School Visit, Jerusalem June 2019



Peacebuilding, Water & Sanitation,
Research, Education and
entrepreneurial innovation
is changing the world for the better

Pure and simple: This is Rotary

**We must examine how to
take the wonderful things you do here
to the world...**



Rotary HandsAcross Water



PDG Fuchs PP Peter Vanek, Dr. Denham, Dr. Sussman, Dr. Shefi in Minister of Water & energy, Jerusalem



PP Ralphi, India and PP Florin, Romania Present local water challenges



Hi-Teach 2020

Rotary Hands Across Water

Presented water challenged (above) and visit the exhibition (below)

Water Filtration by Amiad



Hi-Teach 2020

Rotary Hands Across Water

Filtration using recycled dialysis filters by NUF



Mino the company CEO explains the
technology

Hi-Teach 2020

Watec 2019 Visit the exhibition (above) and devise solutions (below)

Work Together



Hi-Teach 2020



Rotary Hands Across Water

Show Time

Students from all sectors present solutions
Bridging language and culture gaps with
Hands Across Water



Hi-Teach 2020



Rotary Hands Across Water

Waterc 2019 Presenting solution to global water challenges

Dive into modern pipe repair technologies



Hi-Teach 2020



Rotary Hands Across Water



Cross Cultural student group at WATEC 2019 in Tel-Aviv

District 2490 Water & Sanitation Committee
 Holds a biannual International Rotary Watec Symposium
 In 2019 **Gedera and Ashdod** Rotary Clubs hosted the symposium



Governor Matty Harel, PDG Avner Fuchs President Benny Maymon
 And Rotarians from Israel and the world

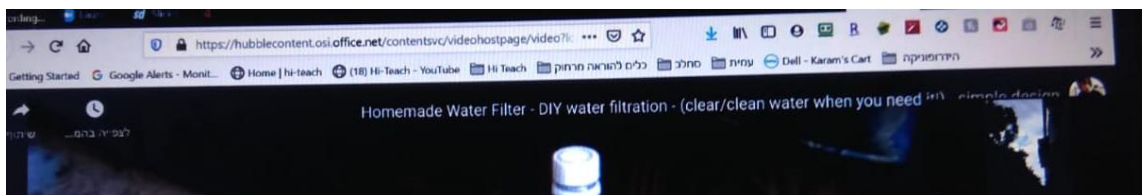


Leading Speakers



Haifa RHAW Host RC

Technology Education and Awareness to address Water & Sanitation challenge”



The Ashdod Water 2019 Rotary Symposium outline the Twinning Program concept

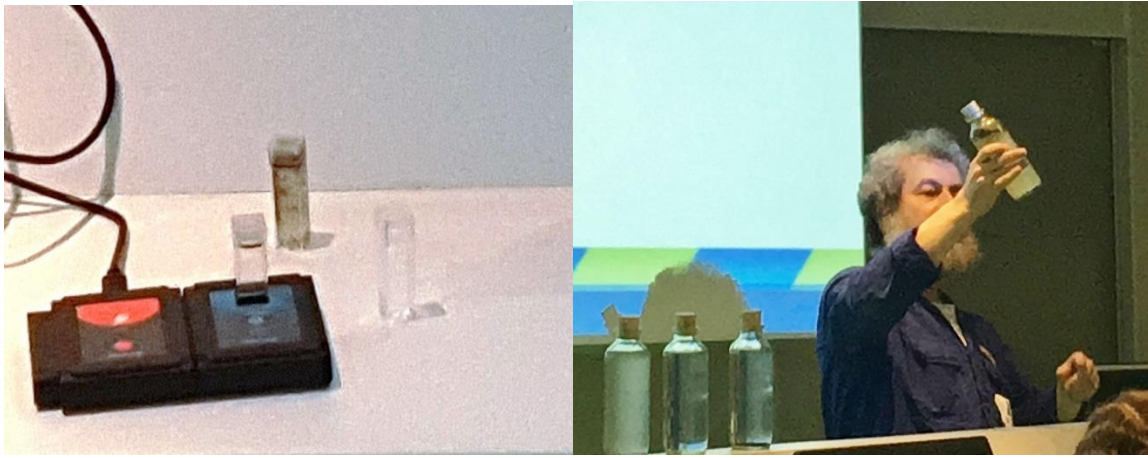


Water filtration experiments run via Zoom at Sorakis





Pardes Hana Agro High School students tour with the city water utility (organized by the Pardes hana RC)



Student visit Bazan refineries visitor center and wastewater reclamation and treatment facility



Poland school generate water picture mosaic



**Rotary Hands Across Water
School Twinning Program**



Miller house hydroponic system

Feedback report analysis

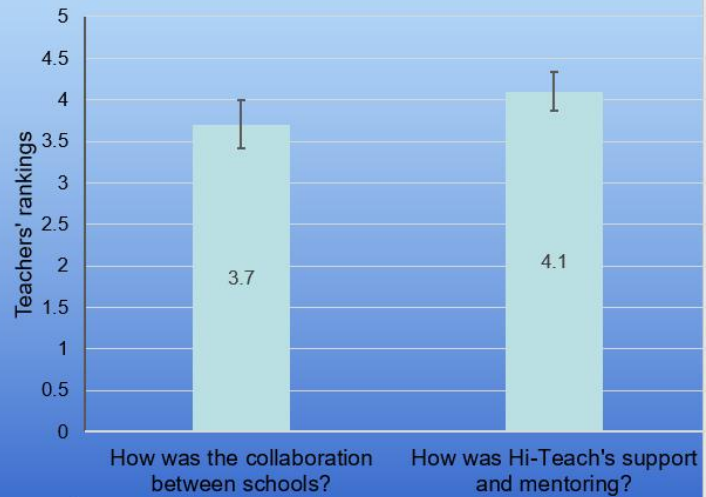
What was the teachers' and students' level of satisfaction from different aspects of the program:

DATA:

	Mean (SD)
Collaboration between schools	3.7 (0.3)
Hi-Teach support and mentoring	4.1 (0.2)

* Error bars represent standard errors

נוער שותה מים ודעת

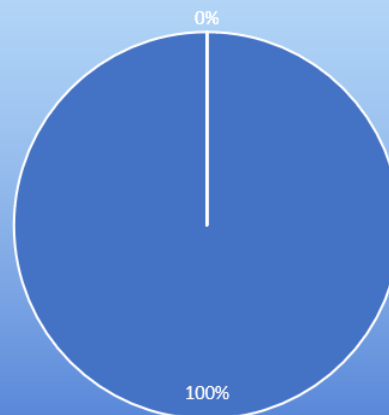


זכויות יוצרים – היי-טק

Following your experience, do you intend to participate in RHAW next year as well?

DATA:

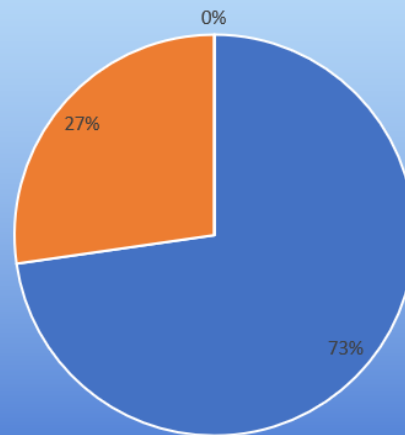
	Mean (SD)
Yes	11
Maybe	0
No	0



Will you recommend other schools from your region / country to participate in RHAW?

DATA:

	Mean (SD)
Yes	8
Maybe	3
No	0



RHAW –Twinning Program

Key points:

- The data shows an important **increase in students' awareness** to water challenges following the program.
- Hi-Teach provided **high quality mentoring** to the teachers and students.
- **All participants** intend to join RHAW next year as well!
- **All participants** consider or intend to recommend the program to others.

25. Haifa informal education activities

RHAW project is a unique educational project that joined forces with Rotary for the last eight (8) years. In the current Global Grant - Phase III, we have continued the project by joining forces with schools in the country in various populations, different religions in the center and peripheral parts of the country. At this present stage we learned how to break new grounds joining forces with Twinning Schools from around the world who shared the universal topic of water challenges and their potential solutions. Additionally, in the current framework, we made the program accessible to non-formal educational institutions, which support youth during off-school hours. The center of the effort this year was within the Beit Miller Institution in a variety of activities throughout the year as well as with Sea Scouts, which forms a new channel to increase awareness among youth and the community by engagement of youngsters in "Clean Sea" activities. Dozens of teenagers took part in these activities, combining education, with mission challenges and adventures, which will remain imprinted on the teenagers' acquired experience, turning them into good ambassadors of the basic idea of conserving water, cultivating, and integrating solutions to protect the environment and help humanity and life on our planet earth.

The Miller House (Beit Miler) is a unique community education and culture center in Haifa Israel. It specializes in the fields of communication, new media, technology, arts, computer system, and young leadership. The house is a unique center for unformal youth development operated by the Haifa city municipality together with the Rotary club Haifa.

The Miller House was donated by Mr. Miler's estate to the Haifa RC. The late Mr. Miller was a Rotarian member of the Haifa Rotary Club and dedicated his house to the Haifa Rotary Club to be used as an educational / leadership development center with an emphasis on technology oriented activity. The education center is operated by the Education Department of the Haifa Municipality with educational activities outside of regular school hours. The center is intended for teenagers from a variety of schools from all communities around the city, including the following schools – Ironi-Hei, Leo-Bekk, Ironi A, Hugim, Jeizaf, School of Nuns, Ironi Gimel, Reut, WIZO, and Reali. The students come from diverse economic bckgrounds different neighborhoods and all religions. The come to the center from from all over the city from Mount Carmel neighborhoods, the downtown and from other less privileged neighborhoods. Anyone wishing to attend the courses goes through an admission process where No prior knowledge or requisites apply other than high motivation, commitment and personal responsibility.

The Miller Education Center, which became a part of the un-formal education system, focuses on technology knowledge and leadership. The Municipal Youth Council – convenes at the Miller House periodically gathering representatives of all the school youth councils around the town.

The Beit Miller Education Center is managed by Rotarian Moshe Bachar, a Roterakt graduate himself, is a member of the Haifa Rotary Club . The Haifa RC Rotarkat club recently established also promotes Rotary ideas and principles is also involved in assisting in community activities. www.bmiller.co.il

Sea Scouts is an association of a youth movement integral part of the (Boys and Girls) Scout Movement in Israel. Sea Scouts are organized in regional tribes along the coastal cities . The city of Haifa is a large maritime center due to the major Haifa port, , the smaller fishing port and proximity to an important center for Maritime studies and training . Many members of the Haifa Rotary Club have a professional seamanship background , experience, or maritime hobbies. Thus, a synergy was identified between the youth and clean seas initiative as part of increasing the International Yachting Fellowship of Rotarians (IYFR) clean sea initiative and the awareness of the water challenges around the world and as part of global sustainability efforts. The RHAW program enabled the teens to become acquainted with the challenges and participate in activities to clean the sea while increasing awareness and visibility among the community. The activity was extended to Tel-Aviv boy's scouts as well.

Following is a summary of the activities conducted as part of the grant as well as a summary of the associated financial budget used in support of the activities

Beit Miller is a multi-generational urban technology education center, which provides the Haifa community with support and knowledge in the fields of technology and digital media.

RHAW project includes several workshops and courses were developed and run at Beit Miller with the aim of encourage the younger generation to develop interest in the subject, raising the public interest in the issue of water and sustainability while emphasizing multi-generational integration.

Activities run at the Miller House used core RHAW content and Hi-Teach support but had a greater reach due to the following additional factors that enhanced the impact and exposure.

1. An international webinar on the production of a campaign on social networks in which 58 youngsters from Israel and around the world participated. During the workshop, the youth learned to develop an online campaign to raise awareness of social issues, gave lectures on sustainability, water and sanitation, global warming, and the importance of saving the sea, the students' final project was to produce a network campaign in one of the study areas.
2. Following the success of the international webinar, another seminar was opened for a multicultural Haifa group (Jewish religious and secular and Arab Christians and Muslims) consisting of 39 middle school youth (7 to 8 grade).
3. An *Urban Art Competition* for the elderly called "You don't exist without the sea" in which Haifa artists produced photographs and songs and short plays on water the sea and sustainability which were exhibited in an exhibitions, A total of about 50 people participated in the competition.

- Four pre-school workshops were operated teaching children about the use and storage of rainwater for irrigation, also created a home system for circulating rainwater for irrigation. A total of about 35 participants.

Other activities

- A multi-generational debate workshop on sustainability, the workshop was held in the late spring in June. During the workshop, the participants received instruction about debate, choosing the topic, presenting the topic, standing in front of an audience, presenting persuasive abilities, abilities and rebelliousness while emphasizing diction and intonation. At the end of the workshop, the participants gave a series of lectures online and throughout the city. A total of 30 participants.
- A campaign in collaboration with Haifa children's artists, intended for kindergartens and grades on age of 8-10 about sustainability and especially the importance of maintaining the cleanliness of the sea and the environment. took place on May with a total of 25 participants.
- A Makers-workshop (called Hydro Makers) was run by Hi-Teach and the Miller House team at the miller house with mixed background students from across town. It focused on the use of technology to develop solutions to existing problems with an emphasis on water and urban agriculture (Hydroponics) . Held during in the spring, (March - June) with the participation of 25 students and neighboring elderly participants from a variety of schools and neighborhoods in the city.



מיזם קהילתי "הים בראי היוצר"

תערוכה ייחודית בשיר, ציור, קולאז' וצילום "אם אין ים אהר לא קיים" מוצגת במרכז הטכנולוגי העירוני במערב חיפה



המוסדות הרב תחומית, אילנה צמחוני, המציגה בתערוכה מיצירותיה, רחוקה את קהל שוחיי הירוקים, פסיכיאטר

עריית חיפה - אגף התרבות והחינוך, בעיר חוף אגודה המוסרית. מועדון רוסי היפה ועוד זה המרכז. יזם מיזם קהילתי "אם אין ים אהר לא קיים".

תאמנה התפקד ועצרת התערוכה, רוצת עשת, עריית חיפה כי מרכז המצגת על עבודות יצירות חיפאים בתערוכה ייחודית בשיר, ציור, קולאז' וצילום, המוצגת במרכז הטכנולוגי העירוני דוני ברחוב המלך דוד 33 במערב חיפה.

התערוכה מסכמת הקומת התרבות של רוצת עשת, כמסגרת כמות אחרות, היחידים חיפה במרכז התרבותית בית מילר במרכז, רוצת עשת אוצרת התערוכה, הוא אשת חינוך, נובלות ומתגוררת, שמסגרת השנים תגה כמה ליצורים החיפאים לכמה מוטיבים ביצירותיה.

לדבריה: "בתערוכה זו אנחנו מורשימים ספרי





**Miler House - Makers-
workshop**



Expense's report:

Collaboration with the Haifa city municipality generated more capital leveraged investment into more projects and activities that coincide with the RHAW program values and goals, increased knowledge and awareness and developing cross cultural activity.

Activity	Total cost (ILS)	RHAW participation (ILS)	Haifa municipality funding (IKS)
international webinar	8000	6500	1500
Multicultural seminar	9000	6500	2500
Municipal competition "you do not exist without sea"	5000	----	5000
Four pre-school workshops	3800	----	3800
Debate workshop	10000	8000	2000
Haifa children's artists campaign	6000	----	6000
Makers-workshop	20000	13000	7000
Total	61800	34000	27800

Sea Scouts, "Keeping the Sea Clean" - RHAW value

The activity of sea scouts this year has been severely affected by the covid virus endemic which has disrupted to a considerable extent the activity plans and required flexibility and creativity. The activity was coordinated by the representative of the Haifa Rotary Club, PP Gidi Yanai.

In the field of "keeping the sea clean", sea scouts held activities in which part of the children of Tzmid took part, (Tzmid are scouts children with special needs), who were excluded from the lockdown for the activities. in part the adult teen guides participated as well.

In addition, teen guides and trainees took part in activities of quality and environmental cleanliness.

The activities they performed included:

- Beach cleaning (including an cleaning an oil spill cleanup of country's shores especially in the north region coast, due to a ship-leak in the eastern Mediterranean)
- Collecting plastic waste on the seashore
- Cleaning streams and wadis
- Establishment of a community garden

- General community assistance volunteering

Estuary measurement activity in the Kishon River planned, as was done with sea scouts in Tel Aviv, but postponed. It is still plan for cooperation with the Miller House and the Interact.

The activity of RHAW with Sea scouts increased and lectures were given on topics related to the sustainability and clean sea. In the meantime, dedicated sails were purchased that bore the Rotary Organization logo under the title of "Clean Sea", which has raised publication and Awareness.

The activity is ongoing and encompasses several dozen students and apprentice from a variety of schools and neighborhoods in the city that are part of the sea scouts.

As part of the program connection was established with Rotary clubs in Greece that expressed interest in joining the RHAW School Twinning program with an expressed interest in the IYFR clean sea activity and we expect these to develop next year,

Keep the sea clean



RHAW informal education activities in Haifa - Financial report:

The RHAW actual activities and expenses was according with budget plan, which fulfill nice and productively. Hereunder details can be found:

6 - Operations Phase 3 Education centers Hi-Teach, **Miller house**, ₪6598 \$1833,
Actual - 6500 NIS

9 - Operations Phase 1+2 schools **Young Speakers** on Water Selected by Haifa & Local RC's ₪9800 \$2722

Actual Debate – 8000 NIS

10 - Operations Phase 1+2 **Low income school** support Hi-Teach or hired by Haifa RC ₪9800 \$2722

Actual Beit Miler – 6500 NIS

11 - Operations STP Pilot outline content & **web** presence Hi-Teach, Haifa RC ₪4900 \$1361

Actual – done by Hi-Teach

12 - Operations STP Program **promotion** in coordination with Hi-teach Marketing support hired by Haifa RC ₪9800 \$2722

Actual – Art collage for logo development support – 4000 NIS

15 - Operations STP **Plastic free oceans** & sea with IYFR content development Hired by Haifa RC ₪17899 \$4972

Actual - Sea Scouts - 16000 NIS

16 - Operations STP Youth interaction & Communication support Exchange, Zoom **Miller house**, RC ₪14700 \$4083

Actual – Makers – 13000 NIS

27 - Monitoring/evaluation Data collection **accounting** Hi-Teach, Haifa RC accountant ₪14700 \$4083

Actual – monitoring & Accounting - 15210 NIS

Grant Application Budget item	Item project	NIS	
6	Education program	6500	19.4.21
9	Debate	8000	29.6.21
10	Multi-culture seminar	6500	19.4.21
11	Web	-----	
12	Logo development	4000	7.21
15	Plastic free project	16000	19.4.21
16	Makers – hydroponic garden	13000	2.6.21
27	Monitoring accounting	15210	2.6.21
Total		69210	

INV 11.4.21 29,000 NIS Plastic free (sea scouts), Beit Miler – Education program & Multi culture seminar

INV 2.6.21 26,000 NIS Beit Miler – Makers; Monitoring (5850 + 9360)

INV 2.6.21 8000 NIS Beit Miler – Debate seminar

INV 30.8.21 4000 NIS logo development (Art Collage Tiltan)