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Mobile technologies for lifewide learning in schools in Israel

Case study by the UNESCO-Fazheng project on best practices in mobile learning



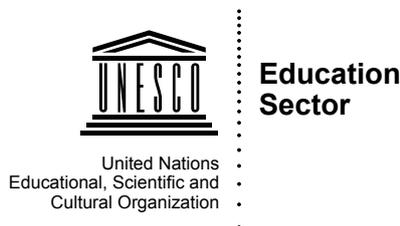
-  Approach: Bottom-up
-  Implementing organization:
Amal Shevach Mofet High
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Authors:
Juan Enrique Hinojosa,
Refaella Ballas and Shani Ziv

Editors:
Fengchun Miao and Anett Domiter

UNESCO Education Sector

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- Anja Balanskat, Senior Manager, European Schoolnet
- Enrique Hinostraza, Director, Institute for ICT in Education, Universidad de La Frontera, Chile
- Cheah Horn Mun, Assistant Provost, Singapore University of Social Sciences, Singapore
- Cheolil Lim, Professor, Seoul National University of Education, South Korea
- Jukka Tulivuori, Counsellor, Ministry for Foreign Affairs of Finland
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Abstract

The project on 'School based lifewide learning using mobile technologies' has been implemented by the Amal Shevach Mofet High School, Tel Aviv since 2013. It derives from the school's pedagogical approach, which aspires to integrate the students into society, and views individuals as independent people and as integral parts of their community.

The lifewide learning project is based on three principles: location (moving outside the classroom to learn in real-life situations), community (giving and contributing to the community) and learning (transforming the role of teachers). Students and

teachers create location-based interactive learning material to characterize some aspects of special places located in their community. The places and their characterization are selected by the teachers to cover specific subject areas of the curriculum, and the material created by the students is made available to the entire community.

The project has been effective in showing the potential of a teaching and learning approach based on involving students in projects that are meaningful and relevant for the community.

If harnessed within a clear pedagogical framework, new technologies can enhance and extend the learning environment for students. The Amal Shevach Mofet High School of Tel Aviv offers lifewide learning to its students, who are required to design and create location-based interactive learning objects (LILOs) in their local community as part of their coursework. They follow a 6-step process from researching information, to making the LILOs and peer evaluation. The aim is to give students the chance to be creators rather than passive users of technology, while interacting with and contributing to their local community.

Dominic Orr, Kiron Open Higher Education

Keywords:

lifewide learning, LILOs, 21st century learning, Wandering platform

1. Introduction and context

Amal Shevach Mofet High School is located in Mount Hope in Tel Aviv. It has 900 students and 70 teachers. The school is part of the Amal Educational Network, a large school network in Israel, established in 1928, with 120 educational institutions across the country, including high schools, junior high schools and colleges, and a total enrolment of over 40,000 students.

Amal Network provides an educational-academic framework with an emphasis on technology, the sciences and the arts, for all strata of the population including high-achieving young people as well as young people who are at risk. The schools in the network were the first to introduce the use of iPads in Israel's educational system, and specialize in integrating computers and information and communication technology (ICT technologies) into learning and education processes.

The network offers study programmes and primarily digital materials for technological courses of study, through a Pedagogical Technological Development Centre (PTDC), a research and development unit which focuses on the development of e-learning environments, digital courses and learning materials, as well as teacher training and mentoring. The network is motivated by a vision of innovation and entrepreneurship, and is constantly developing and experimenting with new tools, pedagogies and practices.

The project, which has been developed at Amal Shevach Mofet High School since 2013, derives from the school's pedagogical approach, which aspires to integrate the students into society, and views individuals as independent people and as integral parts of the community. It is endorsed by the principal, who has a clear vision of the relevance and impact of learning outside the school's walls, which

leaves its mark on the physical and digital public space through signage, flyers, and code scanning on mobile devices. The project is supported by the school's flexible pedagogical and organizational principles, and the principal and management staff give encouragement to the teachers to design and implement creative and innovative projects.

The lifewide learning project started as a small and unique project for a group of history students. Based on its success, it was then expanded to cover material from history and literature, based on a multidisciplinary approach, and was adapted to encourage the participation of students with special needs. After these successful experiences, the project was integrated into the regular school day and after-school programmes, with the participation of middle school students. Today, the project is being used as a model for the schools in the Amal Network, and ten schools are already implementing pilot initiatives.

For each implementation of the project, teachers and students explore their community and identify places that have special meanings or significance. They then create location-based interactive learning objects (LILOs) to describe them. Places are tagged to link the LILO to its location, using GPS data and/or a QR code. Once they have been created and linked, students and community members can activate them using a cellphone or tablet, and learn about the place or object, add comments and share them in their social network.

2. The model

2.1 Vision and aims

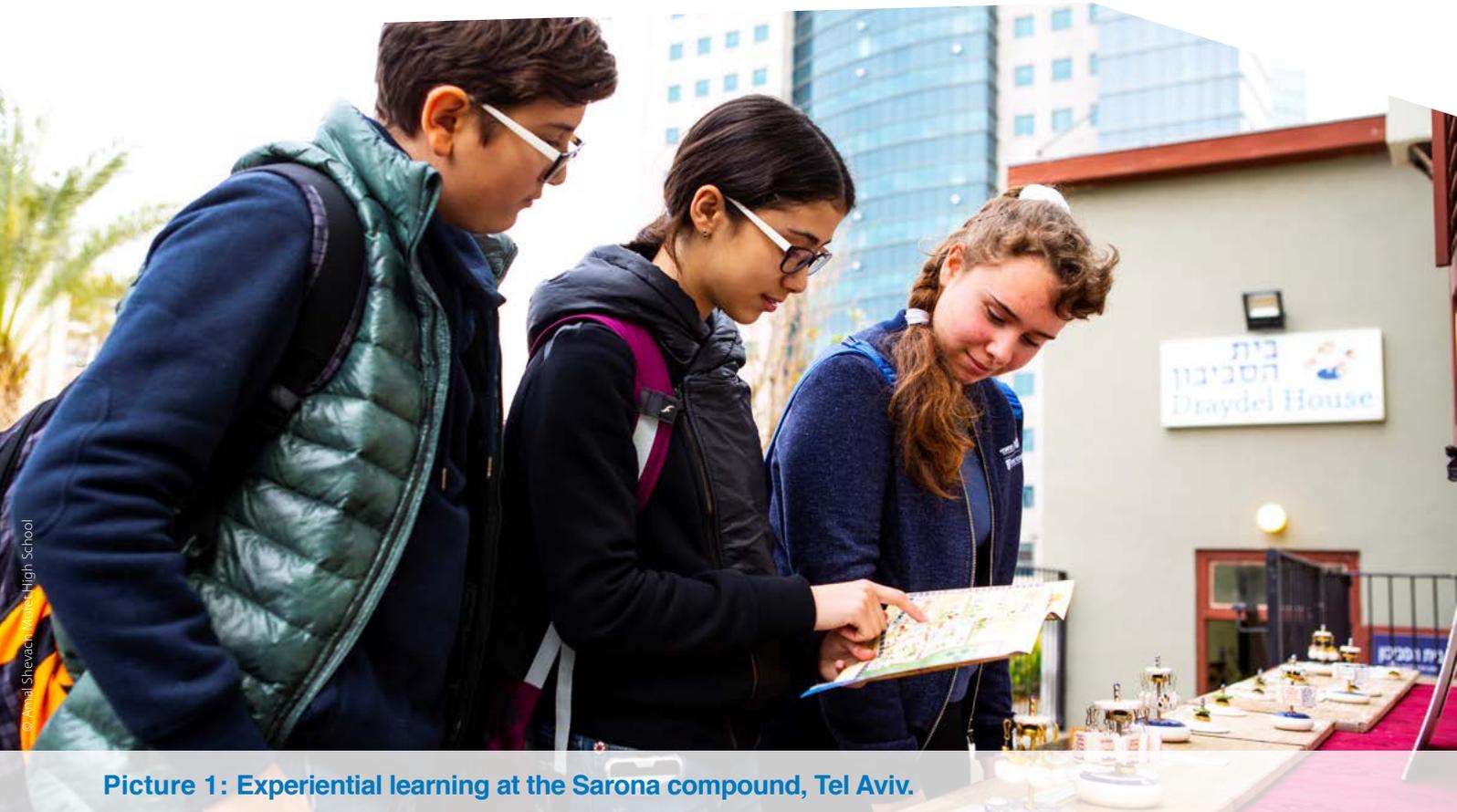
The lifewide learning concept aims to develop a creative, diverse learning experience that is related to real life, and combines different advanced technologies that support pedagogy. The project seeks to narrow the gap that exists in the traditional learning model between school learning and real life, and to engage the students in the value of learning and their environment.

The aim is to implement learning experiences in which the students undergo a process of studying materials, asking questions, and engaging in meaningful learning processes.

The lifewide learning project is based on three main principles:

Location – Moving outside the classroom so that learning takes place in real-life situations. The project invites students to explore and research the history of different places, buildings and people from the city, collecting data from interviews and other sources.

Community – The project emphasizes the importance of giving and contributing to the community. The material created by the students is made accessible to the everyone and is publicized outside the school. The idea is that the material becomes part of the community, so the students leave something behind for future generations.



Picture 1: Experiential learning at the Saron compound, Tel Aviv.

Learning – The project aims to develop students' critical thinking, communication, collaboration and creativity, fostering a change in the role of the teachers so they become mentors of the students. Teachers in the project discuss the questions with students and guide them in the process of finding answers, which in many cases are located in the community. The project triggers a transition from frontal classroom instruction to guidance in the community. Students and teachers make a joint journey in the community, creating new knowledge through experiential, multisensory and multidisciplinary learning.

Based on these principles the school aspires to implement learning practices such as open education, massive open online courses (MOOCs), flipped classrooms, lifewide learning, and learning through play (edu-gaming). It believes that the new technologies allow for a huge breakthrough in everything related to learning practices, and support deep paradigmatic changes in the education system.

Mobile learning is based on a laptop, tablet or smartphone, and allows the practice of lifewide learning from anywhere and at any time, even while on the move, with the ability to explore the environment in real time.

The project is also part of a community experiment by the Amal Network, which creates work and action communities around project-based learning that deals with social justice.

2.2 School-wide planning

The school integrated the project as part of Amal Shevach Mofet's pedagogic approach as a multidisciplinary school, 'Layered Learning in a Changing Environment', developed under the auspices of the Ministry of Education R&D, Initiatives

and Experiments Division. This Division's work is dedicated to addressing the complex challenges proposed by twenty-first-century learning, and providing strategic foresight for the implementation of new activities, practices and techniques in line with upcoming and new trends.

The six principles identified by the Ministry of Education R&D Division are personalization, cooperation, informality, glocality, alternativeness and integration. According to the government, focusing on these six principles will enable the education system to function in unfamiliar future environments requiring new methods and techniques.

The Amal Shevach Mofet school integrates the new learning principles identified by the Ministry of Education into its daily work, providing multidisciplinary learning processes relevant to learners' lives. The school encourages students to use technologies as part of their learning in various disciplines. The students participate in four or five projects over the course of the school year, and as part of their project-based learning they have a chance to meet with mentors and experts from leading industries and companies. The project work involves a technological platform, which serves as a place for collaboration and for the creation of original and relevant social and environmental content. The students engage, for example, in filming and editing videos, designing electronic posters, producing e-books, publishing digital newspapers, and more.¹

At the strategic level, the school's plan was to change the learning culture from curricular and class-based learning on curricula and classrooms to an approach focused on the recognition of students' individual characteristics and skills. It aimed to contextualize learning, taking advantage of the opportunities offered by the surrounding cultural and geographical environment. To achieve this, teachers participating in the project choose subjects that are part of the

¹ See <http://edu.gov.il/minhalpedagogy/mop/pedagogy-disign/Pages/Future-Oriented-Pedagogy.aspx> and http://meyda.education.gov.il/files/Nisuyim/Future_Oriented_Pedagogy.pdf

curriculum and define a theme to develop using the location-based learning model. In this way, the project is implemented during the regular teaching hours and is not an extracurricular activity. The subject areas covered by the project include social engagement, history, civil studies, the Bible and archaeology, Hebrew, English as a foreign language, project management skills, art, literature and ICT.

The implementation of the project also implies collaboration with different people and organizations, including the municipality, museums and members of the community, who facilitate students' access to the places, documents and historic pieces.

Within this strategy, a number of different projects have been promoted. For example, the 'Independence Trail' describes the transition from a 'Hebrew city' to a 'Hebrew state', and 'Cell Aviv' is a touristic project aimed at developing information about different locations in the city of Tel Aviv, which can then be made available on a cellphone.

2.3 Mobile Learning Environment

Although the school has a variety of technologies available for the students to use, the project does not require much specialized hardware, since most of the activities are based on the use of laptops, tablets or cellphones. In addition, for the creation of 3-D objects the students can use 360-degree cameras.

The main platform used for the project is the Wandering Ltd location-based learning environment, which is a web-based platform that was designed to facilitate outdoor, authentic and interactive learning via the creation of LILOs (see Barak and Ziv, 2013). In addition, students use a range of software, including Padlet, YouTube, Thing link (interactive pictures), Canva infographic, Emaze presentations, iMovie or Movie Maker, a QR code generator, Google Maps Street View 360, Google Drive and Google Classroom.

The content created by the students is constantly available to the public and has been integrated into a tourist interface. All content is public and can be accessed on a map created for Amal Network by Wandering.

In relation to security and privacy, students using the Wandering platform are identified not by name but by learning avatars, and they sign privacy agreements as part of the process. The interaction with the avatars is based on e-mail exchanges and is only visible to the system manager. Although the content created by the students is public, their individual identities remain private.

Students have full control of their accounts, which are not accessible to the teacher or network manager. They can manage the comments sent to their account, deleting or accepting them for publication on the site. In addition, there is a mechanism to report abuse, and the system administrator from the company has the right to delete any content or user.

2.4 Capacity-building

Teachers participate in regular and structured training courses held at the school on pedagogical subjects, and new teaching and learning models are also introduced during the regular staff meetings.

In addition, the Amal Network PTC offers in-service training for teachers, including 30 hours of frontal (field) training. Approximately twenty-three teachers per year participate in this course.

The Amal Education Teachers' Laboratory in cooperation with Education Cities developed an online course (MOOC), which is available to all Amal schools, and has been distributed worldwide in the framework of the EDUMISSION global competition. The course is structured in four chapters. The first one presents the concept of lifewide learning and some inspirational examples; Chapters 2 and 3 present the

lifewide learning model, and Chapter 4 presents the evaluation and feedback strategy to be used with the model.

2.5 School-wide mobile learning practice

The lifewide learning project is based on a six-step model through which students learn to research, design, develop and publish content (in the form of an interactive learning object, ILO) that illustrates some aspect of a particular site in the community. It can be the history, geography, architecture, commerce or any other aspect that motivates the students. Using the Wandering platform, students build a game on a map which connects a set of sites (known as stations) that the students research and document during the implementation of each project.

In the **first step**, the teacher selects a place for research. They choose a place with a characteristic that can be related to a particular study subject, such as history, music, physics or biology, or a combination of multiple areas, such as language and music, or mathematics and citizenship, to support multidisciplinary learning. The place can be a city, a neighbourhood, a building, a mall, a market, an archaeological site, a football field, or any other appropriate location. For example, one class focused on Sarona, the Tel Aviv area which was originally built as a colony for the German Templars and explored its historical background in the context of their study of history.

In the **second step**, the teacher starts to review the chosen site, looking for interesting characteristics for the students to investigate that can be linked to one or many subjects of the curriculum. These



Picture 2: Students present their findings to the class and the teacher.

might for instance be stories associated to the site, needs of the community, people once connected to the place, historical events or the architecture. In the Cell-Aviv project (Tel Aviv in cellular) the teacher found several sites that could be related to the curriculum, identifying aspects such as the influence of the Templars, events during the Second World War, the conflict between architectural conservation and entrepreneurial development, and questions of historical documentation.

During the **third step**, the teacher introduces the site and its characteristics to the students, divides them into groups and assigns the task of setting up a 'station' on a predetermined route on the map. In each group some students use secondary sources of information (such as books, encyclopedias and articles) to research the site, paying attention to the reliability of each source (which might be official or unofficial) and any conflicting information that they discover. Meanwhile the other students identify primary sources of information. Who are the key parties to interview? Are they (or their families) still alive, and can they be contacted? If they are deceased, have they left written, photographed or digital evidence? Based on the results, students elaborate a list of questions and prepare to carry out interviews, following a set of interview guidelines and suggestions.

Using the information gathered in the previous step, in the **fourth step** students process the information and prepare intermediate work products that summarize and merge informational texts, edited visual materials, and photographed interviews into one unit. They filter out the excess information and prepare written summaries of the information gathered.

In the **fifth step** students develop a LILO which contains theory (that is, information), images of the geographical context, a learning activity (scientific mission, human interaction, participation), interactive elements and a tagging system. Each station is interactive and it could be a game, a scavenger, or

even a puzzle. After developing and uploading the LILOs in the map, all students in the class experience the game indoors (in other words, they follow the route on the map in a virtual sense). They give feedback to the other teams and make corrections as necessary. Once the corrections are implemented the teacher reviews the objects, and gives a certification stamp before each one is published as part of the map. After this, students go out with all the mentors (teachers) and play at the sites, posting comments at each station and adding new information if available.

The **sixth step** is the evaluation of the product and reflection feedback in which the teacher guides the students to review the process and analyse the products.

The map on the Wandering platform is the final product of the project, and at the end of the project it is made publicly available. During the five years from 2013 to 2018, students from different grades have produced several routes (maps), documenting different aspects of the city, community and individuals.

While students implement the project they need to acquire technological/digital knowledge and orientation, the ability to identify and evaluate learning opportunities, and the ability to manage and organize their learning, as well as the metacognitive ability to analyse the learning process. The aim is to make students creators rather than users.

Mobile teaching and learning practices

For curriculum delivery

During the design of each project the teachers can link the contents to be developed to specific areas of the curriculum. For example in one of the history-related projects which aimed at developing a 'historical route' on the map, students had to collect information about places of historical interest near the school. For this, some students interviewed a retired brigadier-general, other students learned about the resistance operations against the British from a historian and others learned the story of the only Jewish pharmacist in Sarona through an interview with his granddaughter.

The students participating in this project commented, 'It was fun to learn history from those who made the history.'

For inclusion and equity

Inclusion and equity are considered during the design of the LILOs. For example, in the project described in the previous section, during the work on the route, the students emphasized the issue of accessibility for people with special needs and suggested making the information more visually stimulating by increasing brightness, size and clarity, and adding sign language, to benefit anyone with any kind of disability. Also, they integrated a sign language video in the "Run Sarona" Interactive map game at one of the major touristic zones of Tel Aviv, created as part of Cell-Aviv project.

One teacher commented, 'Special education students felt as equals, as initiators. But most of all, they were filled with a sense of pride that they could take on the role of donors rather than recipients, to which they are accustomed.' The project also motivated teachers to take part and initiate other project-based learning activity.



Picture 3: "You are here" - Students compare the map to reality.

For motivation

Students' motivating students is inherent to the project, since they research and develop topics that are relevant and meaningful for them and their community. In this sense, learning becomes significant and pertinent, since their products can be used by a wide audiences and can have a concrete impact in the community.

For example, the Cell-Aviv in Sarona project is currently being developed by the students of the school in cooperation with the Onn Special Education School for children with cerebral palsy. The project's goal is to provide information to travellers, enabling tourists to choose a route and download a variety of historical, geographical and cultural content directly to their mobile phone.

As one teacher explained: *'Students develop internal motivation for learning and project implementation, and are exposed to aspects and layers beyond the standard curriculum. Students develop a commitment to the process and product. Our students are aware of the needs of the environment, and of the city, and create a personal connection with populations with disabilities, a kind of fruitful and empowering partnership.'*

For twenty-first-century skills

During the implementation of each project, students are asked to search for information, summarize text, learn the use of new technologies, create interactive activities, work in groups, provide feedback to peers and develop presentations. All of these skills are considered part of the set of twenty-first-century skills which students need to develop for their future careers.

For problem-solving

Each project is designed as a problem to be solved, since students are presented with a challenge, which

they need to address using problem-based learning principles. They have to define the critical and most interesting aspects that they intend to document, find relevant sources of information, some of which could prove contradictory, judge and select appropriate content, summarize the material and produce a final product to publish.

For collaborative learning

The collaborative aspect of the project has two layers. In the first, students are organized in teams to develop the contents of each station, collaborating with each other. In the second layer, the teams must collaborate to develop the route that links all the stations.

Student assessment:

It includes the following components:

- theoretical work (20 per cent) – a special topic which arose from the station, and feedback on the entire process (group and individual)
- active learning (15 per cent) – the flipped classroom, dealing with information segments, collaborating in online discussions, and carrying out research at home
- new media skills (20 per cent) – assessing the skills of photography, editing, production, graphic processing and use of social media
- final product (30 per cent) – the station for the public (setting up the station with all the necessary elements, and presentations at conferences)
- teamwork (15 per cent) – keeping to schedule, division of duties among group members, assigning special roles

2.6 Achievements

At the school level, the project created a model for emulation. It stimulated enthusiasm among teachers and students, and encouraged the entire school community to promote and develop the pedagogical processes in keeping with the spirit of the project.

The Wandering platform was the subject of a study by Barak and Ziv (2013). They used a mixed-methods model to answer the following research questions:

1. What are the students' learning outcomes and learning experience while creating LILOs and participating in them?
2. What are the required skills for teaching and learning while using the Wandering system?

In the study, 102 Grade 9 students and their teacher were asked to create LILOs using the Wandering

platform as part of an environmental education course. The researchers collected information on the students' performance and their learning assignment, and carried out an in-depth semi-structured interview with the teacher.

The findings showed a positive association between the number of LILOs created and the quality of the contents associated with students' learning outcomes. In relation to teaching and learning skills, based on the teacher interview, the researchers claimed that the platform facilitates students' engagement with others, allows personalization, enables the learning process to be released from teachers' control, and facilitates students' adaptation to change.

Although this evaluation was not done for the Cell-Aviv project, the results are broadly relevant since the evaluation was of a project using the same platform.



Picture 4: Students check the stations they created on the streets of Tel Aviv.

Prizes and recognition

The project received widespread support from many bodies at different levels. In particular, it received full support from the school administration, including the allocation of hours and the funding of transportation to the Sarona area and to the Eretz Israel Museum. It also received support from the Amal Network, which views the project as a model for emulation and learning on the Internet.

The 'Muza' track of the Cell-Aviv project was also supported by the Education Department of the Eretz Israel Museum, which initiated and guided the collaboration. The museum's curators and the various departments provided access to the materials, the museum's treasures, and contributed from the vast body of their knowledge.

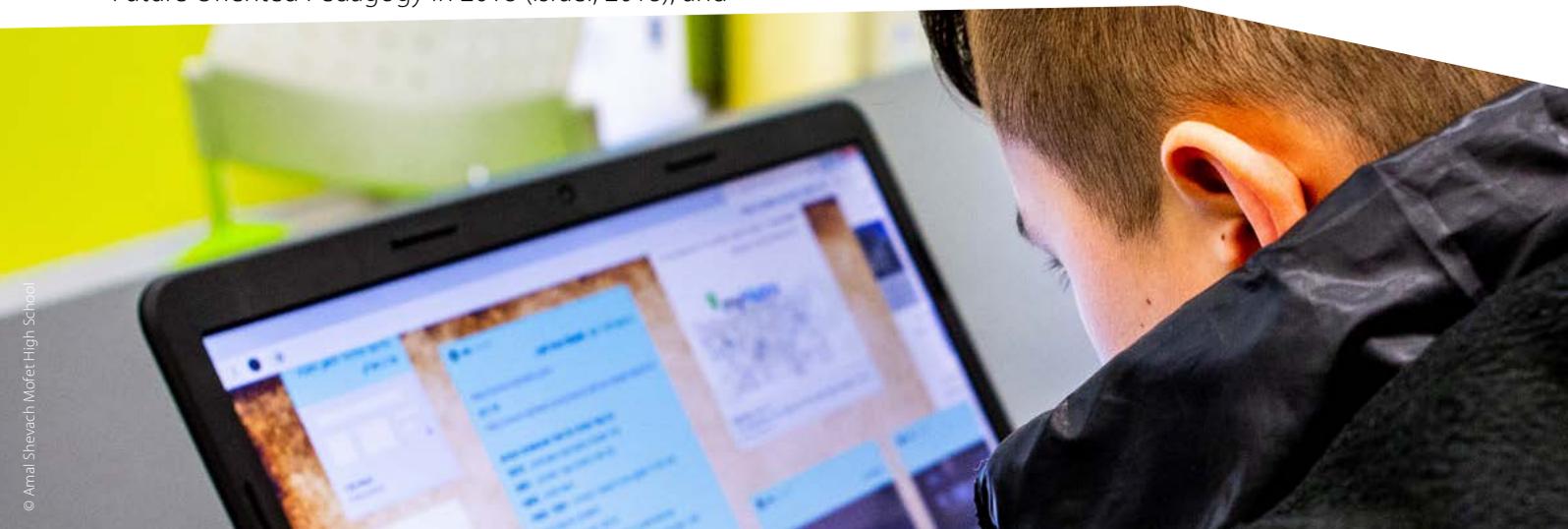
The teachers participated in different school events, city projects, national conventions and international education online seminars, as well as international exhibitions such as BETT.

Finally, the Ministry of Education's R&D, Initiatives and Experiments Division published a report about Future Oriented Pedagogy in 2018 (Israel, 2018), and

presented the model used in the Amal Shevach Mofet High School as an example for teaching and learning practices in the twenty-first century.

The project was recognized as an alternative assessment (worth 30 per cent) and was promoted in various forums, including:

- Entrepreneurship and Innovation award of the Department of Elementary Education of the City of Tel Aviv in 2015
- Recanati-Kop-Rashi Award for Entrepreneur Teacher 2016
- Edumission award for 'Exceptional pedagogic innovation in a school network' in 2017
- Ministry of Education formal recognition as a pedagogy model and learning unit for high school matriculation
- Certificate of Appreciation from the Ministry of Justice and Supervision of Citizenship at the Ministry of Education for social inclusion.



Picture 5: Student planning the stations on a laptop.

3. Challenges and lessons learned

It has been found with many innovative pedagogical practices (OECD, 2010) that implementation demands a considerable investment of time from teachers and students, and in many cases comes into conflict with the delivery of the curriculum. In this sense, the challenge is to have a clear and explicit alignment of the project's objectives with the aims of the curriculum. So far, up to this point the project has mainly focused on the characterization of sites based on the development of LILOs using the Wandering platform. In this regard, the challenge is to move beyond the use of one platform and implement the principles of location-based learning using other systems. For example, a next step could be to explore the use of systems based on authoring augmented reality objects to document places (Akçayır and Akçayır, 2017). The pedagogical approach underlying the model is very much related to the school's community outreach, so the project would

benefit in the future from integrating complementary teaching and learning approaches that expand its impact on the community and the curriculum. For example, service-learning has shown to be effective to develop capability in science, technology, engineering and maths (STEM) subjects (Hayford et al., 2014; Newman et al., 2015) since it complements traditional learning and combines disciplines with their application in a real-world context, which also aids in the understanding of social problems and civic engagement (Garibay, 2015).

All in all, the project has been effective in showing the potential of a teaching and learning approach based on involving students in projects that are meaningful and relevant for the community, and developing real-world material that can be used by others.



Picture 6: Students study in small groups at the school's entrepreneurship center.

4. Transferability

The project has already been extended to a further twelve schools in the Amal Network. To facilitate this, the Amal Network developed a MOOC to encourage teachers and schools to adopt the model, and sent an invitation to the schools to participate. As a result, schools have used the Wandering platform to create a variety of projects, including a game around the city of Safed, mathematical puzzles derived from public buildings in Tiberias and Galilee, a game in English to be used throughout a kibbutz, and the use of alternative energies in Hefziba. This year, Amal is focusing on ecological gardens at four more schools of the network.

The transferability of the project depends on the willingness and ability to change teaching and learning practices: in other words to deliver the curriculum implementing non-traditional activities that take place partly outside the school. Although this can be considered one of the main contributions of the model, it could also constitute a barrier against its adoption by other schools and teachers.

From a technical perspective, the principles of the project can be implemented using different technologies, therefore its adoption by other teachers and schools does not require the use of one particular platform. This can facilitate its adoption by other schools.

From a more general perspective, the implementation of the model also demands the engagement of the school, community, teachers and students with the principles and activities involved. In this sense, the transferability of the model will depend on the capacity to align these actors with the objective of implementing location-based teaching and learning methods.

5. Conclusions and recommendations

This case study illustrates the potential of mobile technology to implement pedagogies that connect learning across school and out-of-school contexts (Rajala et al., 2016).

While the project presented in the case is based on the use of one particular software platform, the underlying pedagogical principles and methods can be implemented using a variety of mobile technologies. In this sense, the project's principles of location, community and learning can be considered essential components of the model for implementing lifewide learning pedagogies in schools.

There are two main characteristics that distinguish this project from some other innovations. First, the material that students develop during the implementation

of each project is made available to the community afterwards and used by the other people. This is an important motivation for students and teachers, since developing 'real-world' products makes their schoolwork meaningful. Second, the themes of the projects that they implement are relevant for both the students and the community. This helps to contextualize the curriculum, transforming teaching and learning into a personally relevant experience. Learning that is relevant to the real life – an activity in which learners study their own environment – enhances a sense of belonging and social responsibility, nurtures a shared pool of experiences, and encourages ongoing interactive dialogue between students and their city, while creating public knowledge for the use and reuse by others.



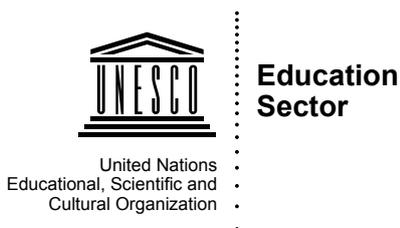
Picture 7: Students experience the cellular game they have prepared for the public, by scanning the QR code on the historical buildings.

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UNESCO Education Sector

Education is UNESCO's top priority because it is a basic human right and the foundation on which to build peace and drive sustainable development. UNESCO is the United Nations' specialized agency for education and the Education Sector provides global and regional leadership in education, strengthens national education systems and responds to contemporary global challenges through education with a special focus on gender equality and Africa.



The Global Education 2030 Agenda

UNESCO, as the United Nations' specialized agency for education, is entrusted to lead and coordinate the Education 2030 Agenda, which is part of a global movement to eradicate poverty through 17 Sustainable Development Goals by 2030. Education, essential to achieve all of these goals, has its own dedicated Goal 4, which aims to *"ensure inclusive and equitable quality education and promote lifelong learning opportunities for all."* The Education 2030 Framework for Action provides guidance for the implementation of this ambitious goal and commitments.



About the Fazheng Group

The Fazheng Group is a multi-business organization in China, which covers a wide range of interests including education. It has established a global school network providing comprehensive coverage of K-12 education.



The project Best practices in mobile learning

Funded by the Fazheng Group, the project aims to guide the planning and implementation of school-wide mobile learning practices. The case study series consists of more than 15 initiatives including both top-down cases driven by governments and bottom-up cases initiated in individual schools, selected through desk research and a competitive call for proposals process.

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