EDUCATION SPACE & TIME TIPPING POINT

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THE EDITORIAL

The after-effects of the limitless (and infinite?) Digital World

"It's always tea-time, and we've no time to wash the things between whiles," the Mad Hatter says to Alice, in Lewis Carroll - Alice's Adventures in Wonderland, with a witty solution to overcome the constraints of time and space to fit his narrative.

As with Alice, a literary character living impactful dream-like experiences, the real experiences of today's youth do not stray too far! Smart-phones, Internet, NASA, Facebook, Metaverse, AI, and I could go on and on ... take us all to live borderless experiences of time and space, even during our most mundane activities.

How does this affect our understanding of the world? Of ourselves? And of the main system dedicated to our youth's learning – Education?

These were the main questions explored during the Shaping the Future Conference, part of Israel EdTech Week, that took place in October 2022.

Experts delved into how new technologies are significantly changing our perception of ourselves and providing a different meaning to the concept of "identity". How do we understand who we are when, emotionally and cognitively, we experience virtual realities that manipulate time and space as well as our presence in them? These experiences occupy an increasing portion of our lives and model who we are. How do we perceive the world, when "local" now includes the most distant regions? What does that imply to our citizen-selves? Our roles? Our responsibilities?

These questions dominated our lives during 2022, and particularly the educational world that has been dwelling with them due to the after-effects of the dramatic world crisis triggered by COVID-19. The significance of the interaction of each one of us with our physical and digital contexts has been the subject at hand. What now? How should we re-shape the environments we were forced to live without? What did we learn about them when interactions were dominated by the limitless digital world? Is it true that the after-effect includes a depression wave threatening our students? Does the experience of infinity in the digital world contribute or is it a way-out of this? These questions MUST be explored by the system in which we force our youth to be during most of their daily lives – Education!

This issue of EdTech Mindset provides a snapshot of the rich conversations that took place at Shaping the Future 2022, in order to inspire education stakeholders to ponder how these essential questions affect their practices – the Education Space & Time Tipping Point!

Hope you feel inspired and empowered,

Dr. Cecilia Waismann
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WHO WANTS TO SHAPE A NEW LEARNING CHRONOTOPE?

by Avi Warshavsky

There is a metaphor used by Seymour Papert to describe the appropriate conditions for effective learning: “low floor, high ceiling.” The low floor is a metaphor for the fact that anyone can enter the world of learning, while the high ceiling is the idea of learning conditions that encourage ambitiousness, and allow one to excel and to climb ever higher. Those who visit MindCET in Yeruham cannot ignore the high ceilings, not just metaphorically speaking. We inaugurated the building in February 2020, a few weeks before Mort Mandel, who generously contributed with a donation and with the planning , passed away, and a few short weeks before the COVID-19 crisis broke out. Moving into the new building generated a movement in the opposite direction from that which was generally felt in those early days of the crisis. This was a crisis that sent people inside, to take shelter in their own homes, while the new facility invited us to go outside.

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The move to the new building had a greater influence on us than we anticipated, and this influence is a good starting point for presenting the topic addressed by the conference,

TO TALK ABOUT LEARNING "ANYWHERE, AT ANY TIME, USING ANY DEVICE" DOESN'T SAY ANYTHING ABOUT TIME AND SPACE; SUCH A SLOGAN EVEN SUGGESTS A LESSENING IN THE VALUE OF SPACE AND TIME AS A TOOL FOR LEARNING – WE DON'T CARE IN OR TIME YOU ARE LEARNING, WE WILL INJECT YOU WITH OUR CONTENT WHEREVER YOU MAY BE

as well as the theme for this issue. The building's high ceiling didn't happen by mistake. It plays an important role in the "mindset" of those working in this space. Unlike what we sometimes tend to think, it is spaces that shape us, no less – and perhaps more – than we shape them.

No matter what our religious beliefs are, or even if we see ourselves as non-believers, it is impossible to ignore the power of a synagogue or a church. Even if we affirm to have no interest, such spaces affect us. The influence of space on us has kept thinkers occupied from ancient times to our days. Jean Jacques Rousseau, in his work Emile, or On Education, taught us that effective learning requires space. Learning takes place when our bodies are involved, when we move about, and when we interact with others. Furthermore, Mikhail Bakhtin taught us that we cannot relate to space without also relating to time. This point can be demonstrated through a simple example, one that all of us are familiar with. Imagine that you have hosted visitors in your home, and you are now escorting them to the door to farewell them. But as they stop at the doorway, you begin another conversation. Generally speaking, such conversations on the doorstep often turn out longer that we would have planned them. This situation blends space – the doorway – and time – the moment at which the guests indicate their intention to leave. Bakhtin called this blending of space and time a "chronotope," a concept that he borrowed from physics. The argument underlying Bakhtin's description is that, in most instances, the influence that space has on us cannot be separated from time. We do not experience space separately from time, or time independently of space. When we are at the airport terminal five hours before our flight, or five minutes before, the significance of that space is totally different from our point of view. This blending of space and time is often dramatic; as in the example of the guests, it imposes on us something stronger than our intentions.

WHAT IS THE PERFECT CHRONOTOPE FOR LEARNING?

What does the perfect chronotope for learning look like? This question has engaged educators since time immemorial. All of us are constantly learning, everywhere, yet there are spaces which are specifically intended for learning, and particularly for learning together with others – schools, classrooms, study halls, universities and campuses. It is possible to think about an appropriate way to design such a space, and its connection with time. The Academy in Athens met in a grove of olive trees-walking among the trees, under the open sky, outside of institutions' walls, was perceived by the Athenians as the perfect space. The Babylonian Jewish beit midrash, on the other hand, was organized in rows, with more experienced, senior students in the same room as younger students who were just starting their careers. The younger ones were at the back, while the seniors were at the front; as a student progressed in his studies, he would be promoted to a seat in a row closer to the front.

If we were to ask ourselves what would be the worst chronotope for learning, one that least supports the conditions formulated by Rousseau for effective learning, one might well assume that the traditional classroom would be a leading candidate. The traditional classroom, with its four walls, in which time is divided into equal periods of 45 minutes, and in which the learners are for the most part passive listeners, treats the learners as amorphous minds, and stands in contradiction to all the characteristics listed by Rousseau: there is no movement, there is no body expression, and it offers very limited potential for interaction with others. It is not difficult to criticize the traditional classroom model, and such criticism is not rare. Numerous thinkers, over a period of more than a century, have challenged this model. But sometimes these challenges make us forget that the mainstream alternatives that EdTech offers also suffer from exactly the same problem.

Of all the wealth that the internet could offer us, the educational world has mainly adopted the promise of flexibility. At the beginning of the 2000s, the slogan "anywhere, any time, any device" was very common and popular, and held a central place in the spirit of what technology-based learning solutions were offering. As a slogan it offers a vision of flexibility and adaptivity, but it also says something else. To talk about learning "anywhere, at any time, using any device" doesn't say anything about time and space; such a slogan even suggests a lessening in the value of space and time as a tool for learning – we don't care in what space or time you are learning, we will inject you with our content wherever you may be. Such a devaluation of the importance of the space and time in which we learn leaves us with the long-standing paradigm that treats learners as an amorphous mind.

A DOUBLE LIFE

If so, what is the right way to design a learning chronotope for the present age, an age that gobbles up enormous distances in a split second, and which seeks immediacy in every field? To address this question, we need to begin with an important characteristic of learning in this era, and that is the split in the spatial personality that has been associated with learning over the past twenty years. All of us – parents, teachers and students – move between two completely different learning spaces – the classroom at school or university, and the internet-based learning space. All of us live in two competing chronotypes, in two almost contradictory spaces.

This dynamic may be compared to the story of Alice in Wonderland. It will be remembered that Alice went down a steep, twisted rabbit hole. Alice's rabbit hole is located in a grassy lawn in the real world, but despite this proximity, it is the gateway to a totally different space and time. This is a space and time in which a different logic operates, the laws of physics are different, and there is a whole other world – strange and wild – of power and control between the relating characters. When the Internet burst into our lives just over 20 years ago, we were all like Alice. We descended into a space in which a special, different rulebook applied. Like Alice's rabbit hole, this universe was very close to us; the gateway to this universe was the desktop computer which sat, like a piece of furniture, in our homes or offices. But the moment we dived in, we found ourselves in a universe in which the code of conduct for discourse was different – for example, people who are gentle in the physical world became coarse and aggressive in the virtual universe. The discourse within this space has greatly expanded our ability to be open and honest, but at the same time it has enhanced our ability to conceal ourselves and dissemble. In this new world there are no shelves or categories for the world of knowledge, only a kind of enormous, flexible tapestry that allows us to search within it. Learning does

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not take place within the familiar hierarchies of the physical world. A teacher of hundreds or thousands, within this space might turn out to be a rather marginal student in the physical world. Within this environment, the boundaries of areas such as sexuality, violence, gender, identity, and politics are broken down and redrawn. Time is flexible, insensitive to the changes of day and night, and space is infinite. In this world we can at one moment be in contact with someone on the other side of the world, and the next moment be in touch with someone located very close to us. This flexibility has a great influence on the concept of community and belonging; circles of affiliation are not limited to the social groups close to us, and we are part of a global community with its own common denominators and its own civil agenda. From the point of view of learning and education, the Internet chronotope also brings with it a new paradigm, central to which is a lot less directed, managed, institutional, and a great deal more spontaneous, motivation-driven, not limited by the categories and divisions of the ordinary world. This space is more turbulent, rich in questions of validation and tensions between the amateur and the professional. This explosion of energy has swept over many and varied areas of life. For example, it has changed the way in which commerce is conducted; it has shaken up our habits when it comes to consuming entertainment; and it has created an enormous range of ways to earn money that were previously unknown. However, with regard to education, the internet has remained an almost separate chronotope; like Alice's rabbit hole, it remans close and accessible, but it has had only a marginal influence on institutional modes of learning and on what happens within schools and universities. Like Alice, as learners we have been left with a kind of double life: in the rabbit hole we experience the crazy, opportunity-filled realities of the internet, while on the nearby lawn we continue to learn using habits and practices similar to those that were customary three and four generations ago. This double life also has a identity-related dimension. As Goffman showed in his influential works in the middle of the 20th century, the role that we play has a significant influence on the way in which we perceive ourselves, on our identity. The physical classroom is an arena in which each of us plays a role: "the cool teacher," "the trouble-maker student," and so on. Over the past two decades, in addition to this arena, we live in parallel in another arena, whose representation laws are set by Instagram, Tik Tok, or Snapchat. This split between the two spaces is also a split between two different paradigms for self-representation and identity.

A TURNING POINT

Apparently, we are on the threshold of a turning point in connection with this split personality. This turning point is also related to deep processes that have been associated with the relevant technologies since their inception, as well as an acceleration brought about by the COVID-19 crisis -from the inception of the internet, it has sought to merge with the physical time and space.

The story of our technological-cultural development might be told as the story of a merger between these two spaces. This journey includes three axes:

The first axis is that of movement, and what guides it is the evolution of miniaturization, which begins with enormous computers that take up whole floors of buildings, through personal desktop computers, and from there to portable computers, down to smart phones and smart watches. This miniaturization allows us to now carry our computing power with us as we move through physical space. We no longer have to go into an "internet room"; that room is with us everywhere we go. The computer that goes with us from place to place can record sound, take photographs, is sensitive to movement, and can navigate.

The second axis is that of connectivity. The virtual world sends out invisible arms into the innermost parts of the physical world, creating the internet of things. The inanimate space around us is becoming more connected to a network of sensors and signals, with doors, cars, washing machines, air conditioners, and toys, all of them part of a branching network of knowledge.

The third axis is that of experience. On this axis, the AR creates a kind of virtual world layer over physical space, allowing us to wander around that physical space while enriching it with relevant elements from the virtual world. This axis can also include VR and the metaverse, in which the movement is in the opposite direction – a space which imitates the physical world, yet exists wholly within virtual space.

This consistent, gradual development was given a violent, aggressive push forward by the COVID-19 crisis. Overnight, the internet chronotope invaded physical time and space. The forced entry into online learning, made the barrier between the two worlds thinner and more fragile. One of the iconic images engraved in the public memory from the pandemic period was that of the lawyer who logged into a judicial hearing, but his Zoom application still had a filter running, which made him appear to be a cat. This was a filter that his young son had left on their Zoom account, and which he was unable to remove. This incursion of the nonsense world from the internet chronotope into the grave world of the law is a concrete illustration of the leakage that we all feel between our internet representation and our institutional representation in the physical world.

Moreover, the COVID-19 crisis has had an influence on discourse regarding time and space in learning, not only in the context of the characteristics of the learning space, but also in the context of where we belong. The COVID-19 crisis was one that was experienced with similar force throughout the world; it was one of those rare instances of a single shared experience for the majority of the world's population. This shared experience is a clear, incontrovertible illustration of the mutual dependence between all dwellers on earth. It is now very easy to explain how the actions of one individual in Europe can affect someone in China, and vice versa.

The diminishing distance between the two learning spaces, between the two chronotopes, creates an opportunity to rethink the optimal learning chronotope, the appropriate mix of time and space, the circumstances in which it is logical (educationally speaking) to have all of us in the same time and in the same place, and those in which there is no logical need for it. Thinking about a chronotope of learning, or more accurately, chronotopes (plural) of learning, has to take into account experiences in other spaces – work spaces, commerce spaces, cultural and entertainment practices, and the dynamics of games. This thinking has to take into account global citizenship, and the internet representations of our identity. It is thinking that has to say, not "anywhere, at any time, using any device," but rather: within particular spaces, at particular times and with suitable devices.

THIS FLEXIBILITY HAS A GREAT INFLUENCE ON THE CONCEPT OF COMMUNITY AND BELONGING; CIRCLES OF AFFILIATION ARE NOT LIMITED TO THE SOCIAL GROUPS CLOSE TO US, AND WE ARE PART OF A GLOBAL COMMUNITY WITH ITS OWN COMMON DENOMINATORS AND ITS OWN CIVIL AGENDA.

GROWING UP AT METAVERSE TIMES - WHO AM I?

"Know Yourself", one of the three maxims engraved at the entrance to the Temple of Apollo at Delphi, reminds us since ancient times that all knowledge begins with self-knowledge. This assumes that every individual has one "self" -- one unique inner being that comprises someone's cognitive, emotional and spiritual identity regardless of the person's physical state. This immutable "self" offers a sense of grounding, helping a person establish his or her place in the world as other conditions change. But what if a young student has many different selves who live in many different worlds? What is the meaning of self-awareness to this student, and how can a parent or teacher who doesn't occupy these worlds offer guidance and support?

This was the question addressed to a panel on "Learning Through Diverse Identities" led by Betsy Corcoran, co-founder of EdSurge, including Dr. Lior Zalmanson, an expert in digital culture at Tel Aviv University, Dr. Rotem Bennet, a pioneer in virtual reality neurocognition, and Shir Schwartz, head of learning experience design at CET.

The panel sought to explore how the Metaverse changes students' perceptions of themselves, as well as discuss the importance of increasing awareness to students, parents and teachers related to these changes.

GROWING UP AT METAVERSE TIMES – WHO AM I?

WHAT IS THE METAVERSE?

The creation of the Metaverse – an immersive, virtual world – made the transition from science fiction to virtual reality in the 1950s, with the creation of the Sensorama Machine. This invention placed the user in a vibrating chair and head-mounted, 3D audiovisual device in order to simulate a motorcycle ride in a city. The Metaverse we know today also began with science fiction, where the term was coined. This occurred with Neal Stephenson's 1992 "Snow Crash", whose characters leave a dystopian reality to enter a utopian Metaverse of virtual worlds. "Neal Stephenson imagines that we'll be connected to these worlds, he calls them 'metaverses', and that most of our time will be spent in these made-up worlds, even living and conducting business there," explained Lior Zalmanson.

Skip to 2011, with the publication of Ernest Cline's "Ready Player One". This book also describes escape from a dystopian reality, but this time into an advanced virtual reality device that reflects progress in the new technologies. These concepts had a profound effect on educationally oriented entrepreneurs including Steven Spielberg and Mark Zuckerberg. Spielberg directed a movie version of Ready Player One in 2018, while becoming a leader in the development and use of virtual reality in entertainment and education. Zuckerberg changed the name of Facebook's parent company to Meta in 2021, thus re-focusing from social media to all aspects of virtual reality. And this has had a profound effect on the way young people relate to themselves, to others, to their environment and most importantly, how big-tech companies mine them for marketable information. "In many ways, big technology companies are the ones who decide for us how our identities are going to look online and in a world that gets more hybrid, this will probably affect our offline experiences as well," Lior said.

FROM IDENTITY EXPLORATION TO IDENTITY SERVICES

As a young Internet explorer in the early 1980s, Lior said, he entered a Phantasmagorical world: "We created avatars, we represented ourselves as whatever we wanted to be; it was also an age of exploring one's identity, of expressing ourselves, you could argue, in probably a more authentic way." But economic and business interests forced a change in the model, he said, citing the dotcom crash of the 1990s followed by the security measures in the Patriot Act after September 11, 2001. "The Patriot Act demanded that people could not hide behind anonymity online; people needed to be who they were and to be accountable for their actions," he explained. These security measures, coupled with the need for a new dotcom business model, resulted in the birth of the Internet's Ad Network model that required users to be themselves: The purpose of Ad Network was to link the tech platforms that were mining accurate information with the advertising community that was selling their users products and services. At the same time, individual users were given a vehicle to self-promote and advance themselves as "Influencers".

Thus, the Internet moved from identity exploration to identity services. Users were prompted to reveal more intimate personal information – for example, by expanding male and female categories to include non-binary, a-gender, androgynous – so it could be mined by "recommendation engines" in order to improve corporate marketing. Users who adopted more than one name were flagged and kicked off the network.

METAVERSE AND PRIVACY

Phantasmagorical gaming continued on a separate track -- initially computer-based, such as Dungeons and Dragons, and then online such as avatar-centric Second Life and the more advanced, user-centric, game-and-commerce Roblox. The latter became the largest social platform for K-12 students during the Covid-19 lockdown, Lior said. With Big Tech focused on all aspects of virtual reality and a ready market of young users, the Internet business model changed to what parents and teachers see today, he noted: Young people creating multiple identities and businesses capturing even more information about thoughts, feelings, emotions and behaviors – both online and offline. "Mark Zuckerberg is trying to compete, for example, with Zoom, making a more immersive space for meetings and classrooms," he said. "So imagine they have access to our classrooms and an idea of who sits next to whom. It's suddenly not just what you speak about online that they know, it's also about your preferences, body movements, hand gestures, how comfortable you are in a physical virtual space.

"When you adopt more than one identity they have way more information about you, not just about the real you, but about the you who you want to be," he continued. "What I worry about is that we are going to capture the wrong parts of both of the histories of the Internet," he said. "We can masquerade between ourselves and fake people and pretend we are other people to other people in the classroom, but the company will actually keep an eye on all of this and retain most of the information for themselves.

"I want to leave you with this," he concluded. "We need to get literacy and understanding and see the business agenda that is happening around the question of Identity."

IDENTITY AT MATERIAL WORLD VS. METAVERSE

What happens to our sense of self when we are immersed in a virtual world and how does it differ from our sense of self in the material world? Dr. Rotem Bennet identified five major assumptions accepted as truths in the material world that do not hold true in the Metaverse and discussed what that means in practice.

ASSUMPTION #1:

Perception of our human body is inborn and fixed. The material world assumption that we have an innate sense of our own bodies is not the case in the virtual world, where studies show that when people embody themselves in different forms – such as an animal with long legs – they feel and believe that they truly have long legs. Thus, in the Metaverse our perceived physical identity is learned, not innate. "In the Metaverse, you can completely transform to anything and the brain believes within minutes that you are this kind of identity," he said.

ASSUMPTION #2:

We all perceive the same world similarly. Perception of the world is largely based on our prior experiences, he said, using some well-known examples of how different people see the same object in different ways. These "priors" are based on experiences such as how light would normally be reflected on an object. But in the virtual world, Artificial Intelligence shapes our environment and the way we experience our environment. "Perceptual differences are learned over time; assumptions in the Metaverse can be arbitrary in terms of being controlled by AI that will generate the Metaverse for us," he said.

WHEN YOU ADOPT MORE THAN ONE IDENTITY THEY HAVE WAY MORE INFORMATION ABOUT YOU, NOT JUST ABOUT THE REAL YOU, BUT ABOUT THE YOU WHO YOU WANT TO BE

ASSUMPTION #3:

My identity has a core, unchangeable inner root; a mental "self", regardless of physical appearance, that cannot be overwritten. This is no longer true in that our sense of self is largely based on memory and memory can be manipulated. He cited experiments where people see invented images of themselves inserted into a photo from the past, and they are asked to tell stories about this "memory". "Just by showing them fake images of themselves from the past and letting them tell stories, they gradually become convinced that this is their story," he said. "Memories can be modified, manipulated, filtered in order to make them much nicer … so will your identity eventually be whatever you decide? Gamers know very well that they can switch among the virtual identities they create, he explained. "If I ask them what they did yesterday, they will think about what they did as a certain character yesterday and they will definitely do this when they are in the Metaverse, completely and immersively embodied in a certain character." Thus, while self-identity is a memory-based, the sense of a stable, core self is an illusion because memories can be manipulated, he said: "In the Metaverse, our multiple identities are based either on the experiences we invent or on those that are created for us by AI."

ASSUMPTION #4:

My cognition is not related to my physical appearance. People traditionally believed that who they are remains constant as their physical condition, or conditions around them, change. However, he said, our cognitive processes do change when we believe our bodies are assuming different forms in virtual reality. In fact, we begin to mimic the neural processes of a baby learning to adapt to its environment. "Cognition can be relearned or reacquired and modified in the Metaverse," he said.

ASSUMPTION #5:

AI will never be indistinguishable from humans; therefore, interaction with AI cannot affect my core Identity. In other words, he posited, "Will the Metaverse be convincing enough to actually make us believe that we have a completely different identity, just because AI decided it?". This can be answered through an understanding of artificial neural networks, he said, in which a network learns through repeated trial and error inputs and reinforcements to both recognize and invent names, faces, patterns and behaviors,

WILL THE METAVERSE BE CONVINCING ENOUGH TO ACTUALLY MAKE US BELIEVE THAT WE HAVE A COMPLETELY DIFFERENT IDENTITY, JUST BECAUSE AI DECIDED IT?

and to make decisions accordingly. "These 'generative neural networks' are creating the Metaverse, generating identities and pretty models and fake identities and fake avatars, so you will never know that they are actually Bots that are walking around and speaking to you," he said.

The same goes for language: "New language models are indistinguishable from humans; you can read whole articles that were written by GPT (generative pre-trained transformer), and you will never know it wasn't written by a human.

"AI will soon pass the basic Turing Test," he concluded, meaning that we will not be able to distinguish between AI-generated and human-generated inputs and experiences. "The Metaverse will be AI-generated and personalized."

However, he said, "Perhaps the most important point, which is overlooked by the experts, is that we are not training generative models in the right direction. We're training them to identify whether something is realistic or not realistic, but we need to train them to make our well-being as positive as possible. That's a tough question because we don't know how to define it.

"So this is the key question for the education experts and psychologists: Define what is actually the thing that we want to see in these social networks and in the Metaverse around us that will make our well-being much better.

"It's not about being realistic, or immersive, or amazing: We want some kind of combination that will enable the AI experts to eventually train the models properly, in the right direction, and the right direction is not about realism, it's about making us happier."

SO, HOW IS EDUCATION AFFECTED?

One of the key challenges for today's educators is to teach students today what they might need to know – or how they might need to think about things – in the future, noted moderator Betsy Corcoran. "What does having multiple identities mean for learning and for the world we're creating in the digital space?" she posited.

It's up to Shir Schwartz, CET's head of learning experience design, to relate the Metaverse, where students live and play, to the physical and online classes where they learn.

"Educators have to understand that students go into the classroom every day with their identities from outside," she said. "Inside the classroom, we need to recognize it and understand it. We need to know which identity everyone brings to their class. We need to embrace it and maybe do things that will help them be more engaged." Unlike childhood 25 years ago, when childhood was hidden, today each moment is documented and uploaded with stories being told and identities being created constantly, she said. She urged fellow educators to understand how students live and communicate on social platforms because embracing those identities will help them advance academically and enhance their general well-being.

All the speakers emphasized the need for digital literacy among parents and teachers as well as students. "In the United States we have some groups that are very focused on digital literacy," said Betsy Corcoran. "They will take school children through examples of the types of photos we've seen here today and say, 'How can you tell the difference? What are the telltale signs?' "

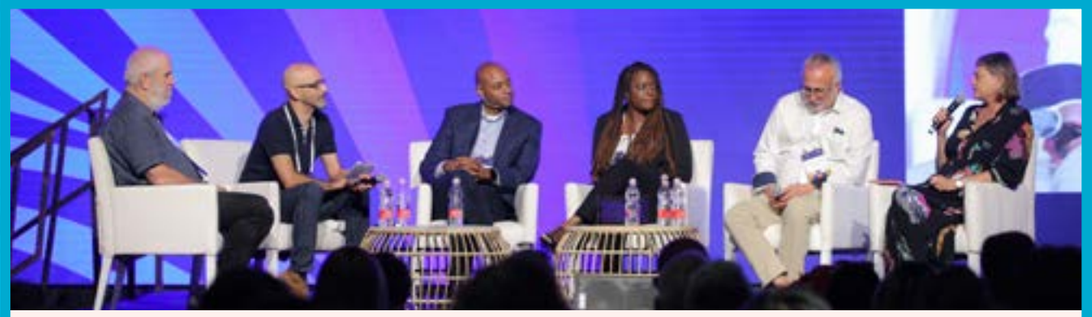
"The key thing is that we need to teach them to adjust to changes," added Rotem Bennet, "because by the time we get to teach them about one particular reality or another particular reality, there will be even more realities. So they need to learn to adjust to changes because the pace is just becoming faster and faster. "They will need to understand that truth doesn't exist anymore in terms of the ability to fake everything; children must know that even if they see a video that's very convincing, it's not necessarily true."

Thus, perhaps the main message the panelists wished to impart to the audience was another maxim engraved at the entrance to the Temple of Apollo at Delphi: "Surety Brings Ruin".

IT'S NOT ABOUT BEING REALISTIC, OR IMMERSIVE, OR AMAZING: WE WANT SOME KIND OF COMBINATION THAT WILL ENABLE THE AI EXPERTS TO EVENTUALLY TRAIN THE MODELS PROPERLY, IN THE RIGHT DIRECTION, AND THE RIGHT DIRECTION IS NOT ABOUT REALISM, IT'S ABOUT MAKING US HAPPIER."

Dr. R.Bennet, S.Schwartz, Dr. L.Zalmanson, B.Corcoran

LEARNING WITH NO TIME & SPACE BOUNDARIES



Prof. Lev Gonick (CIO of Arizona State University, ASU), Dr. Timothy Summers (Executive Director - Digital Trust, ASU), Hasrah Thomas (Director - Realm 4 Initiatives, ASU), Prof. Sheizaf Rafaeli (President Shenkar College Engineering, Design, Art), and Prof. Yuli Tamir (President Beit Berl College), discussed how technology is re-defining educational frontiers, moderated and "challenged" by Ronen Soffer (Mobility, Personal Assistance, Wearables, Innovation Tech Expert)

"We do not bow when you say 'metaverse'," moderator Ronen Soffer politely warned his panelists. "We do not bow when you say AI. We want to know where these things meet us every day -- because if none of it is actionable, we leave this conference with false hope."
Much to his delight, the panelists from ASU rose to the challenge with demonstrations of technology already in use today that creates an astounding array of skills-based, hybrid, school-work-community environments for students.

DREAMSCAPE LEARN

LEARNING WITH NO TIME & SPACE BOUNDARIES

Given ASU's focus on distance learning, adaptable technologies, workforce development and community involvement, the university has succeeded in attracting partners and collaborators that allow it to put into practice what for others remains theory.

"ASU is ranked Number 1 in the US for innovation for the past eight years," noted Prof. Lev Gonick, the university's Chief Information Officer, citing the prestigious award from U.S. News and World Report. "We entered the online world very early, going from an initial 300 students to 83,000 online learners in 2021 – 2022. Over Covid, we decided to completely transform the physical space of the university," he continued. "One million square feet of classroom learning was transformed and reconfigured for collaboration."

This massive shift in time and space has launched some 20 leading edge and actionable projects, two of which were demonstrated by ASU panelists. One is a collaboration with Dreamscape Immersive, a California leader in virtual reality, to teach biology and expand to other subjects. The second is a platform and app called "Pocket" which is a student-centric digital portfolio of skills, achievements and credentials.

DREAMSCAPE LEARN

The objective of Dreamscape Learn, which is the name of the Dreamscape Immersive-ASU collaboration, is to improve STEM education – and subsequently all education – through a completely immersive experience. This is a leap beyond games and entertainment for virtual reality, and a leap beyond what is now traditional online learning for the university.

There is a 48% attrition rate for STEM majors across the US, noted Hasrah Thomas, Director of Realm 4 Initiatives at ASU. Yet, in the next ten years 75% of the highest paying jobs will be STEM-based and there will be twice as many STEM as non-STEM job openings. Even today, there are 1.3 million new STEM-based job opportunities at the bachelor's level with fewer than 600,000 new graduates to fill them, she said. The audacious solution offered by Dreamscape Learn is to immerse students in a virtual world where they study and solve biology-based problems. The drama, storytelling and technical aspects of the program are driven by Dreamscape Immersive founders Walter Parkes, a renowned Hollywood producer, and Steven Spielberg. The incorporation of the biology curriculum is driven by the ASU faculty and student partners. "This is advanced, experiential pedagogy with cinematic storytelling," said Director Thomas, also noting that with Dreamscape as a collaborator, the program incorporates the most advanced, Hollywood-level use of VR capabilities. "We are encouraging student engagement and a sense of wonder, a sense of curiosity that results in persistence; if you're in a place that allows you to be engaged, you're more likely to stay, persist, retain and graduate, she explained."

The initial Dreamscape Learn experience was based on Alien Zoo, which was the first VR adventure produced by Dreamscape Immersive. Alien Zoo allowed users to travel through an orbiting wildlife sanctuary and interact with endangered life forms that were rescued from locations around the universe. It was the task of the ASU faculty, with student participation, to incorporate the biology curriculum into this virtual universe, thus enabling students to perform complex learning, discovery and problem-solving tasks that directly relate to their core biology courses. Beyond that, the program sought to replicate an on-the-job, skills-based learning dynamic that is crucial to career success and will benefit students long after they earn their university degrees. The Dreamscape Learn pilot launched in 2020 with 100 students and continued through 2022 with some 600 students comprising participating and control groups.

WE ARE ENCOURAGING STUDENT ENGAGEMENT AND A SENSE OF WONDER, A SENSE OF CURIOSITY THAT RESULTS IN PERSISTENCE; IF YOU'RE IN A PLACE THAT ALLOWS YOU TO BE ENGAGED, YOU'RE MORE LIKELY TO STAY, PERSIST, RETAIN AND GRADUATE, SHE EXPLAINED.

"This will be seen as an inflection point … when society recognized it had both the urgent need and the digital tools to provide first-class educational experiences remotely to a previously unimaginable number of students in previously unimaginable ways," predicted Walter Parkes, who experienced his own inflection point as he transitioned from production of Hollywood blockbusters such as Men in Black to the production of VR-centric educational technology. In the Dreamscape Learn VR experience, students entered the wildlife sanctuary to study and solve a specific problem: Creatures from one of the species in the zoo were getting sick and dying in noticeable numbers. Students were tasked with identifying the disease, developing a cure, administering it to the animals, tracking success, and adjusting the procedures if necessary. The student scientists traversed the zoo, collecting digital specimens and data. They also traversed inner space by shrinking themselves and traveling inside blood cells. They converted their findings to usable forms in both VR laboratories and online classes. The zoo-laboratory-class rotations –essentially rotations of discovery, investigation, and resolution – continued until the students produced verifiable results.

It was determined that the illness was a particular type of cancer. The students tested and developed a formula to treat it, administered it to the animals and tracked their results as the animals returned to health. The factors that were measured for both the VR and traditional learning control groups included participation, engagement, performance, learning, collaboration and enjoyment. And the results were remarkable. The VR group scored a full letter grade higher than the traditional learning group for the course, and twice as many VR students earned an "A". No disparities could be attributed to factors such as race, gender or socio-economic status, while each of those demographics showed an increase in performance when they were part of the VR group – including those who traditionally struggled with STEM courses. Also significant: Honor students, i.e. the highest performing students at the university, did equally well in the VR and traditional courses. This indicated that the VR course truly did reach its goal to support the overall student population in achieving STEM success. Still to come are a longitudinal study covering retention and graduation rates, expansion to courses beyond biology, and analysis of how the VR experience relates to placement and success in the workplace.

WE WANTED TO ENSURE THAT LEARNERS HAD INCREASED OWNERSHIP OVER THEIR DATA, THAT THEY HAD A TOOL THAT COULD HELP THEM NAVIGATE THEIR JOURNEYS FROM CLASSROOM TO CAREERS

POCKET

Mindful of the warning from panel moderator Soffer, Dr. Timothy Summers was careful to begin his presentation by saying, "I play with futurist tech and make it practical today."

Dr. Summers, executive director of product development at ASU, introduced Pocket, a platform and app for lifelong learning and workplace/community development. Pocket falls into the general category of digital learning records and verifiable credentials. But in practice, Pocket offers much more: It offers innovative benefits to the individual student to create a personal and professional portfolio, as well as a bridge to the workplace. Conversely, it

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provides employers with a bridge to reach and interact with prospective and existing employees.

"Something really, truly amazing about Pocket is that we put the learners right at the center," Dr. Summers explained. "We decided to take an eco-system approach to it with learners being right in the middle. We wanted to ensure that learners had increased ownership over their data, that they had a tool that could help them navigate their journeys from classroom to careers. We also wanted to empower them with more control over their records." He said the most on-target and powerful user feedback he received was from a student who said, "It's like owning the masters to my own music."

Pocket is a major enhancement to the Digital Backpack already issued by this technologically oriented university. The Backpack is issued to all incoming ASU students. As the majority are employed at one or two jobs while pursuing their studies, the Backpack includes tools that are commonly used by employers in this blended world such as Zoom, Slack, Dropbox and Google Suite. Pocket is at the leading edge of two major student and future-student priorities: "Fifty-six percent of Gen-Z teens believe a skills-based education makes sense, while sixty-two percent want to forge their own educational path," Dr. Summers said. Thus, the core focus of Pocket is to provide students with a tool to capture all their academic and business learning experiences – as well as life achievements – in a convenient and usable way. Each student's Pocket can include skills, courses, degrees, experiments, awards and credentials in multiple formats that can be shared with others -- including potential employers.

Regarding credentials, Pocket's platform is designed for businesses and institutions to issue and accept verified credentials such as transcripts, credits, certificates and degrees. "We're really trying to build a massive network of partners to participate and issue credentials that leverage Pocket," Dr Summers continued. This involves a level of collaboration that brings the university further into the realm of business-oriented product development and brings developers closer to the university. And it results in Pocket's advanced capabilities in required features such as ETL data integration (Extract-Transform-Load) which combines data from multiple sources into a single system for storage and use, and multi-institutional MVP (Minimum Viable Product) for validations, feedback and ease of use.

Additional features necessary for broad university-to-workplace utility and adaptation include flexible authentication, authorization and rule-based access control, and automated configurations, he said. Having accomplished this, Pocket is now equally useful to students building and sharing their portfolios and employers using the information to search applicants and employees for the skills need at any given time.

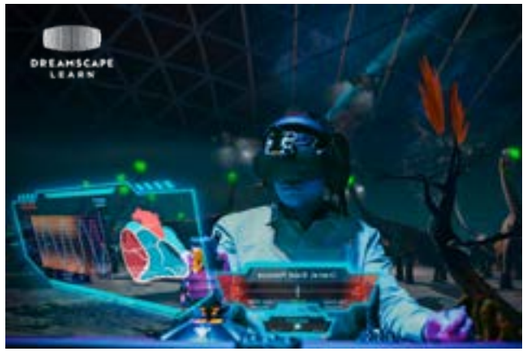
"One of the biggest challenges that companies have is seeing the talent that already exists in their workforce that can be tapped for any given project," Dr. Summers said. "Imagine if the folks working in a company could actually make their skills public to accomplish this." For example, Walmart has already asked ASU to investigate the feasibility of issuing Pocket to its employees to help them traverse and move up the management ladder. And in a related ASU program, almost 10,000 Starbucks baristas have completed their degrees at no cost to them.

ACCORDING TO PROF. RAFAELI, THE CONSIDERATION OF PURPOSE AND VALUES IS CENTRAL TO THE EXAMINATION OF TIME AND SPACE THAT ADJUST RATHER THAN "TRANSCEND" THESE BOUNDARIES.

CONNECTING WITH TEACHERS

A critical perspective was added to the panel by two leaders of academic institutions– Prof. Yuli Tamir, currently president of Beit Berl College, a multi-disciplinary institute for higher education - and previously a Minister of Education - and Prof. Sheizaf Rafaeli, president of Shenkar College of Engineering, Design and Art.

Prof. Tamir emphasized the importance and need of teacher training so that in-school implementation does not flow directly from developers to students. This is often the case, she said, because teachers are not adequately trained to understand, adapt



and integrate the new systems into their coursework. "A lot of what happens in the technological world is people with great ideas, really inspiring ideas, developing wonderful tools and then implementing them in schools over the heads of the teachers," she explained. "The fact that the teachers are left out means this is not going to be the basic way we teach, and I fear we may miss something that would be a wonderful collaboration." This is particularly important with the skills-based applications currently being emphasized at ASU, she said. "Skills are everything and other things are secondary; you need a developed, wide range of skills to do anything." Meanwhile, she noted, Israel is an example of a subject oriented curriculum with specific programs determined "from the top" and insufficient support for teachers to develop their own skills. Prof. Gonick responded that perhaps more could be pursued in this area through collaboration with ASU's teacher's college – the largest teacher's college in the U.S.

In addition, Prof. Tamir said – and Prof. Rafaeli agreed – that teaching and inculcating a set of values should be a crucial component of education in general and STEM education in particular.

According to Prof. Rafaeli, the consideration of purpose and values is central to the examination of time and space that adjust rather than "transcend" these boundaries. "The subjects we need to study and critique ethically regarding technology, the measuring sticks all of us need to bring when we talk about technologies, about funding new enterprises, infusing these innovations into our educational systems -- we need to take into consideration where we'd like to be in the continuum of time and space," he said, rather than believing that time and space can be somehow overcome. For example, he said, this would include considerations related to time such as synchronous or asynchronous learning and considerations related to space such as in-place or distance learning and work, or whether we want "school" to be a building or a concept.

Prof. Rafaeli emphasized four additional dimensions beyond time and space that demand scrutiny:

- **Direction** – who communicates with whom and how they communicate, i.e. speaker-audience vs interaction, or top-to-bottom vs participation.
- **Play** – bring play back to the learning space, he urged; the best teaching technology is playful, and simulation based, such as the example of Dreamscape Learn.
- **Network** – while we all are exposed to networks, we have not yet incorporated and adapted its language, metaphors, mathematics, etc. into our day-to-day thinking: "Let's bring the network into the administration of learning," he said.
- **The Intersection of Engineering and Design** – this dimension is key to the new meeting points of artificial intelligence and machine learning with creativity, he noted.

"We are still having a conversation of STEM or not-STEM, values as opposed to STEM – no, it's those things working together, it's the interactions of design and engineering that should find their way into the curriculum using technology and decisions about the ethics of technology in our lives, including education," he explained.

"It's time and space, but it's also play, it's also interaction, it's also the notion of networks, and it's also the notion of design and engineering working together."

WEAVING THE FABRIC OF GLOBAL AND LOCAL EDUCATION

While a tactile sense of culture and community bestows the life-force oxygen of education, students increasingly are learning in a global technology space that does not require, nor even desire that oxygen. Since both are necessary for 21st Century learning, how can they best be woven together?

This was the question tackled by a panel of researchers and educators that was well-suited to provide both analysis and practical solutions: moderator Adam Freed, a partner at GSV Ventures who focuses on teacher-created classroom resources; Dr.Tali Yariv-Mashal, director of the Beracha Foundation; Prof. Christine Legare, founder and director of the Center for Applied Cognitive Science at the University of Texas at Austin; Joysy John, strategy and digital transformation director at Trinity College of London international exam board, and Shirley Rimon, head of education administration for the Tel Aviv-Jaffa municipality

WEAVING THE FABRIC OF GLOBAL AND LOCAL EDUCATION

One answer can be found in Tel Aviv, a city which itself is woven from some of the most disparate populations to be found anywhere. “We have a very diverse city, and we are proud to be a very inclusive city with a very inclusive educational system,” said Shirley Rimon. “We have many religions, many cultures, many backgrounds and such an economic gap, so we adapt the school system into each land of identity and community. That’s why our school system is regional; students study next to their homes. “We try to make every school part of an ecosystem,” she explained. “We collaborate with industry, with the local grocery, the community center – all the community around the school – and we bring education from the outside in. We broke the walls, we go to the roof, we go to the beach, we go to the park – all this is what we learned from Covid – so the city is one big school.” The ecosystem is based on family and community values, she emphasized: “We cannot talk about education without speaking with the parents and listening to the parents.” With this foundation established, “the skills the students need in this global technology world” are added. Thus, students benefit from individualized learning when they connect to instruction via global technologies, but they do so with their feet firmly planted in the ecosystems of their own communities. Also important is the socio-economic leveling effect of decentralized, local schooling, which is why Tel Aviv students walk to nearby schools. “Transportation requires money,” she said. “If we start with paying for transportation, we already made a gap between students whose parents can pay for transportation to a better school and parents that must stay in the neighborhood. “Public education in Israel is very strong, and we’re very proud of it,” she continued. “It’s our role as educators to give the same chance to all students no matter where they were born.”

While Shirley Rimon spoke about building a foundation from the family outward, Dr. Tali Yariv-Mashal, director of the Beracha Foundation, stressed the importance of starting with a student’s sense of self.

Citing Freud’s theory of self, she noted the importance of self-reflection in helping a child develop a sense of security and safety, and the importance of devising ways to do this in a global learning environment. “Freud told us in 1923 that all begins from the self, it begins from our ability to see ourselves, to reflect on ourselves, to understand ourselves, and only through that will we be able to see others, reflect on others, be in communication with others,” she said. “How do we now provide more opportunities for connection and safety in space at a time when we’re all out there, our identity is completely open? It’s an issue of technological identity -- we cannot hide behind any kind of a curtain, not a virtual curtain and definitely not a physical curtain.”

IT’S AN EXTRAORDINARY, TECHNOLOGICALLY SOPHISTICATED AND COMPLEX ENVIRONMENT THAT MIGHT FEEL NATURAL TO US, BUT HAS ONLY BEEN AROUND FOR A FEW DECADES, MAYBE A FEW HUNDRED YEARS, MAYBE, GENEROUSLY, A FEW THOUSAND YEARS. THIS IS NOT THE CONTEXT IN WHICH HUMAN MINDS HAVE BEEN OPERATING FOR THE ENTIRETY OF OUR TIME ON THIS PLANET.

A.Freed, J.John, Prof. C.Legare, Dr. T. Yariv-Mashal, S.Rimon

Just as it’s useful to apply Freud’s thinking to the technological age, the same holds true for the work of Thomas Dewey, who focused on the importance of community and direct, trial-and-error experience, she continued. “One of the biggest challenges for the experiences that the virtual world gives us, or that technology gives us, is how we get hurt; how do we replace the feeling of physically standing up again, and to keep going through learning, through asking questions and through creating?”

Her solutions point to professional development of teachers, concentration on students from challenging social and economic backgrounds, and community involvement. Along with other speakers, she cited the challenge of a mandated, top-down program that can limit a school’s ability to tailor a community-based curriculum. “We will not be able to find ourselves as global citizens, or understand global challenges, if we do not start with the here and now, with our community, with our ability to actually touch the challenges, to help create a solution to our social disparities, to our ideological disparities, and to our challenges of environment and sustainability,” she said. “Technology is not helping us in this sense, or not enough,“ she continued. “Not because it’s not willing to help, but because our ability to look at the individual, to create that connection to his or her time, place and social and economic situation is limited. So we will have to open up these abilities of our teachers, our schools, and then use technology to help us do that.”

The issue of culture and community as it relates to both individuals and schools was addressed in depth by Prof. Christine Legare. “Culture is the currency that schools operate in, that’s what schools were really designed to do,” she said. “They were designed to create culture, transmit culture, also to transform culture. I think about the human mind as a cultural learning system.” Today’s technology-based culture is a recent phenomenon, she reminded the audience, and we have only limited experience in adapting education to this sophisticated and complex environment. Prof. Legare cited the example of a young, self-taught engineer from Sierra Leone named Kelvin Doe. He is now an adult, but at the age of 13 he independently built a battery-based invention from scrap metals and electrical components that supplied electricity to his village. He was clearly gifted in his ability to identify raw materials and combine them to create a new and advanced technology, a skill which is the basis of most innovation, she said. “He created a technology that was in fact far more complex than the technologies our species has developed over the vast majority of human history.”

But he was able to do this, she emphasized, because he benefited from the accumulated knowledge and

WEAVING THE FABRIC OF GLOBAL AND LOCAL EDUCATION

history of innovation of many previous generations – what's called "cumulative culture".

"We have to consider that this is the environment that children are currently living in and learning in," she explained. "It's an extraordinary, technologically sophisticated and complex environment that might feel natural to us, but has only been around for a few decades, maybe a few hundred years, maybe, generously, a few thousand years. This is not the context in which human minds have been operating for the entirety of our time on this planet."

Schools are a critical component in providing a bedrock of cumulative culture to students, who will use that foundational knowledge in order to innovate, she said, citing the ongoing, critical interplay between the individual student and the school in the creative process. "The extraordinary thing about the humanbrain is its flexibility, how plastic it is," she said. "A child can learn anything – any language, any skill. No other species has that kind of flexibility. I think it's worthwhile to just sit and be dazzled by how powerful our minds are and their ability to learn really anything they're exposed to." Still, individual humans cannot independently build most complex technologies, and therein lies the cultural purpose of schools.

"A big part of learning is about acquiring and instructing and transforming information, and schools are transmission systems," she said. "They store, they transmit, and they build upon the knowledge and toolkits of previous generations. Individual humans cannot independently build most complex technologies without this background," she explained.

"Schools are clearly critical to the accumulation of the cultural knowledge that makes us capable of innovations that any single individual would be unable to develop in their own lifetime."

However, children like Kelvin are increasingly going to school and having access to both accumulated knowledge and new technologies at unprecedented rates, while the consequences of this exposure are still poorly documented, she warned: "We need to understand much more, the impact that of all these different kinds of technologies have on the developing mind."

Something that makes this challenge easier, apparently, is that children everywhere seem to learn the same way and schools across the world are also quite similar, she said. Children have an extraordinary capacity to learn almost anything that's presented to them, but they do it through similar techniques of observation, exploration, participation, imitation and instruction. "This is true everywhere in the world," she continued. "My team and I have done research on this for decades, all around the world, and children everywhere learn in these ways."

SCHOOLS ARE THE MOST POWERFUL, SUCCESSFUL, CULTURAL INSTITUTIONS EVER IN THE HISTORY OF THE SPECIES – MAYBE SECOND OR EQUAL TO RELIGION," SHE SAID. "MOST OF WHAT WE NEED IS COURAGE TO TAKE RISKS AND TO DO SOMETHING THAT'S RADICALLY DIFFERENT.

She noted that variations from society to society certainly exist, for example: beliefs about learning; social organization; socialization; the types of knowledge and skills that are valued; educational system practices, and other such factors. These variations should be kept in mind as educators develop a global and local pedagogy, she said, yet at the same time schools throughout the world are amazingly similar. "Populations differ in almost every possible way, yet, if you go into a school, they sure look very similar; it's extraordinary how similar the reproduction system that is a school is, in very diverse populations.

"I would argue that schools are the most powerful, successful, cultural institutions ever in the history of the species – maybe second or equal to religion," she said. "Most of what we need is courage to take risks and to do something that's radically different."

Assessment and certification were the next topics in the mix, as framed by moderator Adam Freed. "One of the things that happened with the pandemic was that it became harder to manage exams," he said. "We couldn't figure out how to proctor them, how to make it all work. Now we're seeing, actually, a movement in some places in the U.S. away from these standardized exams at the exact same time we see a need for certificates and other professional proofs of work.

"How is the world shifting from the exam board perspective?" he asked Joysy John. Until recently, she noted, technology sought to replicate the model that had been used for some 150 years. At first, examiners would travel by boat to different parts of the world to administer assessments and tests. Later, they would travel by plane. More recently they moved to video-conferencing. More recently still, she said, the field has been moving to an AI-supported model that combines teaching, learning and assessment. "What we know today is that these technologies can change how we assess, how we rethink teaching and assessing, and what we are teaching," she said. "Using AI, we monitor people's hand movement, or any movement, which gives you feedback on a much more real-time basis rather than waiting for a high-stakes exam. So, we ask ourselves, what can we do as an exams board that's not just high stakes assessment, but that actually helps you learn."

She noted a recent example from India, which faced a shortage of music teachers at the same time it dealt with a highly structured curriculum. She said that twenty to thirty student keyboards were connected to a single teacher's dashboard, and that the teacher was able to provide individual feedback as they played. Students used the same platform to both learn individually and practice at home, which allowed the teacher more time to help individual students excel according to their particular needs.

"We need to start assessing not just the technical things that are easy to measure, but also the human skills, the human ability to empathize, work together, collaborate, communicate," she added. "These are the 21st century skills that are so crucial – resilience is crucial."

To this point, she noted that the previous day's MindCET Hackathon offered one of the best examples of how to create new assessment models that suit the global-local space.

Given learner-led pedagogy, where students say what they want to learn, the question was posed: How to you measure learning, how do you provide assessment, when fifty different students are doing fifty different things?

"In a single day Hackathon, we actually came up with a minimum viable product to say how we create a common language for assessment," she said. "How we measure feedback, not just from the learner, but from the teacher, from their peers, from parents, so that everyone understands not only how they're making progress, but also what they need to improve."

This example of in-the-moment innovation caused Prof. Legare to relate some of her field experiences, in which she studied the introduction of school to a particular population for the first time. "One of the fascinating things about working in a population where schools are very recently introduced, is that there's not the assumption that these things are inherently useful, or natural, or normal, or even necessarily the best way to educate children," she said. "So it's an opportunity to act critically, reflect on what schools are for, and what are better ways to do it – to ask, what can students learn that's useful and actionable in their lives and the lives of their families in a meaningful way."

(HOW) CAN WE HELP OUR STUDENTS BE COMFORTABLE IN AN EVER-CHANGING WORLD?

(HOW) CAN WE HELP OUR STUDENTS BE COMFORTABLE IN AN EVER-CHANGING WORLD?

by Dr. Tali Yariv-Mashal

As education professionals, we often find ourselves discussing current changes and challenges that we are experiencing globally, trying to understand how we can best address them in schools. There are so many global challenges that touch every aspect of our educational understanding and of the activity of teaching and learning. From climate change to political instability, changes in work environments and vast and never-ending technological developments that relate to every aspect of our lives. For young students in schools, these never-ending movements continuously challenge their understanding of their social, emotional and physical environment and their ability to feel safe within them. We see how young adults are struggling, as they become young

citizens of nations and see the connection between the local and the global changes. We are currently experiencing a wave of responses of these young adults as they try to identify ways to influence world leaders, to make meaningful decisions and take responsibility for the damages of global warming, economic disparity, or national and cultural tensions and wars. These young adults use every possible means to address their distress: from the 'trend' of destroying works of art, youth demonstrations and climate marches, to the recent call by Greta Tonberry - the leader of the youth protest to boycott the World Climate Conference due to the deep mistrust for world leadership. These protest actions indicate both their concern and fear and their deep frustration due to the lack of power and ability to influence.

I would like to suggest that the possibility of these generations to influence their future relates, to a great extent, to the education they are given as well as to the ways schools address the interconnected challenges of civic education and education-for-sustainability. I relate to the concept of sustainability as consisting of three areas: environment, economy, and society - and the great challenge of finding the balance between economic, social development and environmental balance. In my relation to Civic education, I include the values of liberal democracy, education for shared multicultural citizenship and "civic literacy" –the skills that must be acquired to become a citizen in a democratic country. The connection between these two areas is critical to one's ability to become what I will define as a "Glocal citizen" - a person that is rooted culturally and socially in a local national environment and at the same understands and is related to a larger concept of global civic responsibility. I believe that we will not be able to develop a balanced social and economic system (both locally and globally) without a deep understanding of the connection between democratic civic commitment and universal environmental commitment. If we accept the basic assumption that schools were created to enable human development, then we must ask ourselves what are the concepts and skills that will enable our students to understand and cope with the local and global ever-changing environments.

What could education for Glocal Citizenship look like?

To begin such journey of developing social identity, we must begin with a delicate process of awareness of our self - the initial features of our personal identity. Our ability to be aware of our surroundings and to reflect on the connection and responsibility towards it must begin with a personal journey of self-reflection. This is an active process of questioning, reflecting and relating to our close surroundings through experience. We begin with the research of our family and close community, define what features of this community are part of us and develop the understanding of our own identity and what influences it. Only after this very reflective process, can we continue to look at other communities, relate to them and begin to understand the mutual process of socialization. From a policy standpoint this would require us to look at the professional development of teachers. It would also ask us to equip our teachers with the professional abilities to develop such processes of self and social reflection in the classroom, and to give them the professional and personal confidence to lead the students in the most empathetic and holistic way, and to contain the variety of personal and social identities in the classroom.

This initial process of self-reflection can then assist both the teachers and the students to look at the wider social contexts and reflect on their relation to it. Through looking at values of democracy, equality and justice in the close context, one can develop the ability to analyze the larger global context that touches on the challenges of climate change and global sustainable development. Only through the acceptance of values of responsibility for the common good, can we accept the dangers of global climate change, economic disparities, and the challenges that they bring to the future of mankind. Based on such knowledge and understanding, we can then encourage our teachers and students to investigate questions of civic responsibility and activism. In order to help our students to be active in determining their future, it our role to encourage them to research and relate to the issues at hand. When public discourse is simplified into short twitter sentences, it reduces the deep emotional and social contexts that it is meant to express. In the context of climate and sustainability, for example, a simplistic discourse will not express questions of equality, or the various possible perceptions and challenges of economic development. It is through experience and exploration of their local community that young adults can understand their power and their ability to influence other wider communities. And it is by way of finding their individual interests and connections to the larger contexts, that they will be able to be comfortable and safe in expressing their fears, hopes and ideas for change.

From a policy standpoint, literacy is key. Knowledge that leads to awareness, that leads to action. Here, the connection between self-identity, civic education and education for sustainability becomes evident - a person is not born with an understanding of self, neither of community nor responsibility. These are all concepts that must be taught, explored, and understood, and they must find their way into our schools from the very early stages of literacy to adulthood.

A COLLECTIVE SPACE & TIME EDUCATION PERSPECTIVE

It's a given that educators teach today for what students may need tomorrow. But what if we did know what's coming tomorrow? Would we adjust what and how we teach in order to better prepare students for their future lives and careers?

Dr. Tamar Elkeles, a recognized leader in enterprise education, certainly has her finger on the pulse of the evolving corporate workplace. Based on her long career as Chief Learning and Talent Officer at Qualcomm, where she was responsible for hiring, developing and retaining an international workforce, she is uniquely qualified to enlighten educators on what lies ahead for their students as they enter the workforce.

A SPLINTERED WORKPLACE

Despite our current sense of post-pandemic dislocation, certain lockdown-inspired trends in the nature of work will accelerate well into the future, she said. These include the hybrid, home-office workforce and the gig economy.

About 60% of the U.S. workforce goes to an office part-time and about 35% doesn't go to an office at all, she pointed out. That leaves only about 5% who are working in an office full-time. Meanwhile, more than 41 million Americans are gig workers -- independent workers with multiple jobs.

"By 2030, only nine percent of the workforce in the U.S. is going to be fulltime, which is a massive change," she said. "How are we going to train and educate and develop these people?" Plus, "The average shelf life of a particular skill is only five years."

CAPACITY, NOT SKILLS

Based on this short shelf life, she said, it's increasingly important to teach students how to think and to develop their general learning capabilities. "I don't think we should be building skills," she said. "We need to build capacity to think, capacity to learn. We're not hiring for skills anymore in the corporate setting, we're hiring for your attitude and your ability to learn. "Skills are less important than developing career capability, developing employability -- not necessarily for a specific skill set, because if you're changing jobs this often you can't be specialized, you have to be much more generalized."

When surveyed, some 74% of employees said they believe it's their own, ongoing responsibility to become educated for their work.

Dr. Elkeles challenged the audience to pivot from teaching benchmark skills toward teaching learning capability. "When you build capacity, you're building human value," she said. "We are in the human value era; it's no longer machines that are producing money in organizations and for economies, it's people. We need to help people think differently – not building a skill like math or science, but how to think about the world; how to think about things in context knowing that you might have many different jobs in your career, so you need to know how to think."

This includes learning to work with and/or manage a robotic workforce, she emphasized.

"Mackenzie Consulting did a report recently that nearly one-third of today's work can be done by technology or potentially a robot, so we need to think about what we are doing to educate and train our students, so they have the capacity for learning, the capability for cognitive processing and for creativity, as we think about these robots that may displace 35% of current jobs."

SELF-LEARNING

It's to be expected that education will evolve with greater emphasis on teaching students to learn independently, Dr. Elkeles noted, citing a study by Common Sense Media that ten percent of "zero to eight year old" children" in the U.S. use their own mobile devices.

"Who trained them to use these devides?" she asked the audience. "Did they use a training manual? Did they read a book? Did they go to a training class?"

Apparently, they were in basic training: they watched the adults around them scroll through their phones and other devices and copied them. Once they saw things happen on their screens, they continued their activities and learned by trial and error.

"This is the generation that's coming into my workforce," she said. "These are my interns. Today's learners grow up doing things like listening to music, watching movies, looking at photos on a mobile device. Do they want to sit in my corporate training classroom experience? Not necessarily, they want something that looks very different."

This has spawned two significant changes, she said. One is that corporate leaders including Shell, Verizon and Bank of America are investing in immersive learning technologies for the workplace. Another is that corporations are investing in social media "Influencers" to communicate: They've learned that young people in need of instruction turn to YouTube or Master Class, and that consumer messaging is more effective when delivered by an entertaining celebrity or peer.

Specifically, she said, consumer engagement with corporate messaging is seven times higher on social media platforms than through direct corporate advertising.

SKILLS OF THE FUTURE

While Dr. Elkeles had urged teaching capacity rather than benchmark skills, she focused on the importance of teaching the skills that are necessary to develop learning capacity. She cited a study by the Harvard Graduate School of Education on Next Generation Skills – the skills that large employers consider the most important for future employees to have.

The list's top five skills in order of importance:

1. Thinking
2. Self-Understanding
3. Empathy
4. Ethics
5. Communication

"New ways of working, new ways of learning, emerging technologies are making a massive difference and leading the way for a critical transformation," she concluded.

"The future of learning is in our hands collectively. I'm here to help you and you're here to help me look at education as an ecosystem -- look at what I'm doing in training and learning within organizations, rethink what we're teaching, how we're teaching it, and why we're teaching it.

"We need to focus on building capacity, to look at social learning in influencing people to learn, to look at immersive learning and how we can utilize that, and really focus on critical thinking."

FLYING HIGH TO BREAK EDUCATION GLASS CEILING

FLYING HIGH TO BREAK EDUCATION GLASS CEILING

by Yossi Baidatz

It turns out that, when I was a child in the 60s of the last century, I was already exposed to 'Educational Technology' that diverged from the traditional time and space dimensions of school. When I'd come home after school, still chewing on the remnants of lunch, I would tune the family radio to Israel's 'Chanel B', and excitedly await the beginning of the program called 'For Mother and Child,' which broadcast stories, songs and games for children of my age. Sometimes I would listen alone; at other times I listened with friends.

One of the serial stories that sparked my imagination was The Wonderful Adventures of Nils, whose opening words still reverberate in my memory to this day.

The Hebrew version was set as a poem. The English translation reads as follows: "Once there was a boy Little Nils, who was a goose shepherd. He was, let us say, a naughty and mischievous guy, who never liked to work and study. He passed through forests, lakes and mountains in the company of a flock of gray geese. This is the tale about Little Nils and his wonderful journey"

This radio broadcast was based on a well-known book by Swedish author Selma Lagerlöf, who had contracted polio in her childhood and had not gone to school, but who later became a teacher and author. Lagerlöf was commissioned to write the book as an aid to lessons in geography and for learning about the Swedish homeland. The main character, Nils, was a child who was different - he did not like studying or working in regular frameworks. After encountering a wild goose, Nils had the opportunity to learn in a way that was better suited and personalized to him. He was transformed, developing an imagination and a curiosity for learning, and even improving his behavior and attitude toward others. Lagerlöf's style of writing was not accepted by all – it attracted criticism on the part of more conservative educators. However, the book later became popular among children around the world. It showed them a way to learn that was different from school, at a time and space that were more convenient for them.

For the past few years, I have been the CEO of CET, the Center for Educational Technology, an independent, non-profit organization, whose purpose is leading relevant education and learning in the ever-changing reality of the Digital Age, for the benefit and prosperity of K-12 in the Israeli education system, including all its diverse components. All that through R&D, implementation and operation of hybrid learning environments, that combine content, skills and values with advanced technology.

CET's strategy aims towards pedagogic goals such as: equality in learning, personalization, 'the teacher as a mentor,' 'the independent learner,' data-driven learning, content literacies, alongside learning skills, SEL, 'educator as a learner'. These goals are based on 3 strategic pillars which constitute the 'CET Approach': Hybrid Learning Environments in which digital is the leader, online Professional Development for teachers, and the 'VirtualVirtual Campus,' which is an expression of an innovative learning paradigm that departs from the traditional time and space of learning.

Imagine that, in a few years' time, middle and high school students will be able to select three subjects or courses, which they will study with students and with teachers who are not from their own school. While data-driven learning management will remain with the organic school, the dimensions of time and space for learning may move outside the four walls of the school and the tradition of frontal lessons, in which the teacher generally attempts to transmit the knowledge that they possess to the approximately thirty students in their class, over the course of about 45 minutes.

The physical school will continue to serve as the principal learning center, where students will meet teachers and other students for learning and social activities. Complementary to this, a 'National Virtual Campus' will allow the student to make individual choices in a variety of fields and skills, in different learning tracks, and using synchronous and asynchronous virtual learning solutions.

The Virtual Campus is derived both from exploring relevant initiatives from around the world, as well as from CET's extensive experience in virtual learning of this type. Around two decades ago, CET developed the Virtual Mentoring program, which successfully provided learning reinforcement in advanced subjects, particularly STEM and language, to high school students in Israel. This was through a different set-up from traditional studies, in terms of both time and space. Learning took place in a synchronous-virtual setting, in small groups of 3-5 students, facilitated by an outstanding university/college student, and arranged at different times during the day, so as to be convenient for the students. In its peak years, the program, which was adopted by the Israeli Ministry of Education, included about 10,000 students in a variety of knowledge domains. Subsequently, CET developed the 'Virtual High School,' which allowed students in peripheral areas to study advanced STEM

Sweden twenty (20) tjugo kronor banknote, depicting Selma Lagerlöf and her book "The Wonderful Adventures of Nils"

subjects, when their own schools did not have teachers or offered courses who were appropriate to that level. In this case, a specialist teacher would teach a class synchronously; the students had available to them asynchronous learning websites, and in addition there were weekly practice and exercise virtual sessions held in small groups. It may be assumed that these programs were a key factor in enabling the participating students to pursue social mobility and economic prosperity. Based on this successful experiences, other programs were developed along the same lines, such as social learning through large WhatsApp groups facilitated by a teacher, mathematical literacy studies, languages, and more.

Our research has identified similar models from around the world such as: FLVS Flex - Florida Virtual school, TVO ILC-Independent Learning Centre Canada, TXVSN - Texas Virtual School Network, CIERD SPAIN - Integrated Center for Regulated Distance Learning, VHS USA MA - Virtual High School. In spite of the variation between the different learning methods, there is a common theme: personalization for the students, variety in the courses and levels of learning, flexibility in the learning model, and lifelong learning skills development.

This is the basis for a current development at CET - a pilot Virtual Campus, in cooperation with NGOs, members of the Israeli hi-tech community, and the Ministry of Education. The idea is to create a virtual layer that will be complementary to the students' organic schools, and which will offer two main tracks: an elective track – full-scale virtual learning for subjects that are not taught at the school, but which are chosen by the student as part of their own timetable; a complementary track –a virtual response to assisting students on subjects taught in the organic classroom. All of the learning will be managed on the basis of a national, data-driven system, with feedbacks to the learner with individual formative assessment, to the teacher to better manage learning, and of course to the school.

This new learning paradigm has the potential to advance significantly education systems that are willing to adopt it, with the following advantages: a response to the shortage of teachers, both in number and quality; up-to-date learning skills; modelling of relevant learning and teaching; a flexible model that allows access to numerous students; social learning and skills development; formative assessment, particularly in STEM and languages. The pilot will provide important information about the expected system resistance such as: conservatism within the educational establishment, fear of "going back to the Zoom classes of COVID days," the need to re-organize schools, the re-configuration required on the part of the Ministry of Education, and of course funding considerations, all of which will lead to further in-depth reflection.

It seems that many education systems have come to the conclusion that the traditional paradigm creates a 'glass ceiling' that limits learning relevant to the Digital Age in which we live. In order to free ourselves, we ought to fly on the wings of our imagination, like Nils, the goose herder, created by the Swedish teacher Selma Lagerlöf, and make a change to the dimensions of time and space that we have become so accustomed to.

THE VIRTUAL CAMPUS IS PROPOSED AS A KEY CONCEPTION AND PLATFORM THAT WILL ALLOW US TO MOVE OUT TO NEW VISTAS THAT ARE AWAITING THE STUDENTS OF THE FUTURE.

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