

THINKING AND TAKING ACTION ON EDUCATIONAL INNOVATION

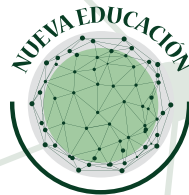
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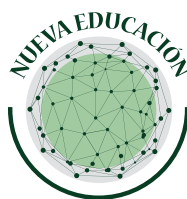


BELGRANO DAY SCHOOL





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Educating for the society of tomorrow. AI and the future of education

The COVID-19 pandemic has brought an unprecedented digital transformation in educational systems, one that was unimaginable both for the pace of change and disruptive impact.

It is foreseeable that there will be a significant number of opportunities linked to the improvement and application of new technologies and new learning formats or models, which coexist, for the time being, with the current formal system. Yet, we note that this vast set of resources will not only modify what we know today, but also outline the beginning of a new and radically different educational panorama that we are not yet in a position to measure.

Twenty years ago, despite the discredit of a large part of the members of the educational system, we anticipated how the Internet was beginning to have an impact on education, its processes and institutions. Today it is evident that there has been a radical transformation. Likewise, today we are witnessing a disruptive process with technologies related to Artificial Intelligence and education. On this occasion, however, we notice that this disruption goes beyond modifying what already exists. This is a revolution in learning that will drastically change what we understand as the formal educational service today, both in the way institutions provide these services as well as in the institutions and in the students' and tutors' work rationale. We do not know for sure what will become of it, but it is not far off that these technologies will assume an increasingly leading role in the formal and non-formal learning process, which we must remain open to.

AI is already present in our daily lives and in various sectors, though we may not be fully aware of its application. Similarly, and as stated by the IDB (Inter-American Development Bank, 2020), AI will have, and in some cases already has, at least the following applications in education: personalization of learning (adaptive teaching systems), collaboration for group work, gaming platforms adapted to the player for learning, and diagnosis of problems or error correction and educational management (data collection and analysis for diagnostics). Some recent examples of successful developments involving AI are the learning platform implemented by China in schools (Squirrel), the X-Prize winning literacy programs, augmented reality applications, and the design of metaverses for educational purposes.

We envision that bringing AI into the instructional process has three levels where debate is taking place.

- First, empowering the **learner** of any age. Data-driven systems should be thought of to better understand the learner's talents and needs in a timely and comprehensive manner, i.e., long before reaching qualification, and in a much richer way, according to the potential of his or her psychophysical development.
- Second, to massively dispose of the **technological resource** resulting from AI application for the different topics or degrees of learning.
- Third, an **ecosystem** that facilitates people's learning by redefining spaces, times and roles of the learner and of the "teaching mentor".

More than a century ago, Bertrand Russell warned us that the educational system had to modify its logic. Now in the 21st century, many of the models and practices that were defined more than 150 years ago still prevail.

The Internet is already integrated into the logic of formal education systems. Virtuality and the resources for it, which was seen as a far-off possibility and not very applicable to "true quality education", is increasingly incorporated into both formal and informal education. And even more so, it is creating formal and informal professional certification niches with market agents beyond the academy and the states.

Equally, there is today an ever-increasing acceleration in the incorporation of new technologies such as AI. In the near future we will have ways of learning and teaching that we cannot yet foresee and that will radically change the variables and parameters that we know today as the educational system such as costs, classroom, school, teacher, etc.

Global society already has the connectivity and data processing resources to make a competitive leap.

Based on the hypothesis of these future radical change scenarios, we have been working for more than 20 years to build a K-12 model open to innovations that will allow us to move towards the imagined and even unimagined scenarios.

The BDS model

The following are the fundamental guidelines of the educational model we have established as a basis for implementing innovations at Belgrano Day School (Buenos Aires, Argentina, founded in 1912, henceforth, BDS). Throughout the years of this century, we have built up an important set of innovative practices that contribute to school transformation and to the development of individuals of people who can work independently in any working or academic environment, regardless of the fact that these environments are volatile and ever changing. Transformation is more complex than the implementation of substitute models.

We have defined five dimensions that guide our research and practices:

Learner Centered: We understand that learning takes place in a community and all its members are learners. A person is an active subject, protagonist of their own learning processes within these communities. Learning environments should be designed based on each learner's needs, talents, interests, rhythms, experiences, and motivations, to promote their autonomy, enhance their creativity and encourage them to be the creator of their future.

Cloud Learning: Learning is ubiquitous and takes place in hybrid environments. It is linked to the opportunities offered by each space beyond the primary or secondary learning cores. New technologies incorporation redefines space and time variables, which reveals a high pedagogical potential.

Global learning: In an increasingly multicultural and hyperconnected reality, educating citizens of the world implies building a view of learning that has no cultural or language barriers, but is nourished by all the knowledge produced by humanity, which today's technologies make available. In this context, the concept of person is vital to understand how we constitute ourselves as social subjects through the bond with a diverse otherness.

Media and ICT literacy: Throughout history, educational systems have been shaped by the articulation of various technologies for teaching and learning. However, living in the information age, in which the flow and volume of communication has an unprecedented speed and flow, demands the reformulation of what we call literacy to one that includes the new digital tools which are in constant change, and that allows the individual to learn to engage with others, and with knowledge in new ways throughout their life.

Assessment for learning: New actors emerge in the educational field and dispute the legitimacy of knowledge, skills and experiences. Education is also offered by companies, trade unions, and state and private organizations, among others. Today's challenges include the articulation and recognition of knowledge, the proper accreditation of such knowledge regardless of where or when it was acquired, and the finding of more efficient certification models.

We will now explain the practices that, guided by these areas, are carried out in each school level at Belgrano Day School.

Kindergarten

The Kindergarten project offers an affective, respectful and safe environment. It is a comprehensive educational program that contributes to the development of habits, adequate socialization, and the promotion of creativity and natural curiosity. That is why playing, as a way of learning par excellence, has a privileged space in this stage.

In addition, we provide an optimal environment for bilingualism development. At this stage, when children are like “sponges”, bilingualism is achieved through an early immersion into English similarly to their mother tongue acquisition. Bilingualism is a key competency for the lifelong learner and brings benefits in cognitive flexibility as a global skill to children.

To this end, there are two bilingual teachers in each classroom and we have designed a multimedia habitat in which carefully selected visual and auditory stimuli create the appropriate atmosphere for children to acquire oral skills in English, just as they do with their mother tongue.

In this period, the foundations for citizenship development are built by respecting turns to speak, learning to listen, sharing games and tasks, etc. The use of technology and audiovisual media is integrated into the daily work-game for the development of thinking, by presenting various challenges. Classroom equipment, tablet devices available and a wide variety of interactive digital materials in both languages allow us to take the first steps in the teaching of robotics and computational thinking.

Primary

In Primary’s project, we have taken up the concept of learning as a capacity per se, a general “know-how” inherent to the child’s tasks, and therefore, we regard the path from first through sixth grade in primary school (P1 to P6, in two cycles) as a transition to “learning to learn”.

For each grade, we deploy a project with its contours and depths that is articulated year by year in two cycles: first, second and third grade (P1, P2, P3), first cycle; and fourth, fifth and sixth (P4, P5, P6), second cycle. The basic skills that make up primary education (reading, writing, oral and written communication in bilingualism and logical-mathematical, scientific and critical thinking) are approached from a constructivist pedagogy for lifelong learners’ development, which allows children to grow in autonomy and to be able to act on their own and overcome daily challenges.

Be it for the development of reading comprehension in both languages or Mathematics, the use of adaptive platforms allows the teacher to design alternative paths according to their students’ needs and styles, as the platform itself also provides the next step or challenge to the student in their interaction. The teacher can track the progress in the chosen skills acquisition according to instructions while offering a challenging online learning environment, based on each child’s starting point. Then, the platform’s own algorithm automatically adapts the proposal according to every child’s interactions. This is how we created Benteveo, a platform that uses artificial intelligence for reading fluency assessment in 1st, 2nd and 3rd grade of primary school. The application features a simple interface that invites the child to read and then listen to themselves reading, and quantifies reading fluency. Factors such as immediate and personalized feedback and gamification present in these platforms aim at fostering student motivation and involvement for self-learning.

On the other hand, the strong development of virtual classrooms to which all children from first to sixth grade have daily access in a blended learning modality, with some completely virtual experiences. The virtual classroom is the product of each teacher's own design and creation based on general pedagogical guidelines. It is the teacher who curates the cloud content and makes it available to the student's personalized learning path, assisted by BDS Library in the selection and categorization of specific resources. This allows a high number of daily interactions in the virtual learning space - even after the isolation forced by the Covid19 pandemic, where it registered a historical peak - and there has been a growing trend in the last 10 years.

Therefore, we seek to offer children a space to meet with their peers, with their teachers and with knowledge, with no physical limits imposed. We call Extended Virtual Space (EVE), or simply virtual classroom, to have a scenario that is always available and accessible at any time for everyone to continue with their learning process, for asking questions and consultation, for interaction between peers, for teacher feedback, and for inquiry and personal curiosity opening doors. Thus, every group can customize this space during the course duration; the teacher designs it during the year, adapting its style, proposals and dynamics, and taking into account its participants' personalities. The curriculum, therefore, takes on life and meaning in the exchanges of this small learning community.

Middle & Senior School

Middle School has a demanding curriculum, of a very high academic level, with international programs and exams in English (some of them completely virtual), which reinforce bilingualism, as well as sports and artistic, community and solidarity proposals, which together promote each person's comprehensive training.

Blurring of classroom boundaries has, at middle school level, a twofold approach. One is experiential learning outside school environment. The other involves learning proposals in the cloud, which we have been promoting for several years now (with very valuable and successful experiences since the influenza AH1N1 of 2009) and which the pandemic proved that we were on the right track.

We are committed to an experiential education that enables students to put into practice the knowledge and skills acquired throughout their schooling in other contexts. We aim to make the students conscious participants of a "know-how" in real situations, with the tensions that this entails, but in a careful space according to the age of each student. We are inspired by various national and international projects, both past and current, which provide elements to build this model. The German education system and its dual modality, our country's technical education or the alternating schools in rural education, just to name the most recognized, have moved away from encyclopedic models and succeeded in combining education with practice.

Its implementation enables each student to choose their area of performance on the basis of the chosen orientation. Hence, it has an impact on adolescents' motivations, which are so important for learning. In addition, it allows them to approach an integral practice, not individually but in small groups of peers to favor collaborative instances, which is the privileged way in which they work, learn and produce knowledge; and to have a follow-up through virtual classrooms in the cloud.

On the other hand, when we refer to learning in the cloud we are talking more of a logic of reasoning and action than of the means we use for it. Learning in the cloud implies a set of knowledge and skills that go beyond the merely technical and technological, in instrumental terms. A paradigmatic example is the Dual Diploma, an optional, extracurricular program for middle school students, which offers the opportunity to obtain two degrees simultaneously: the national high school diploma, in the classroom (under normal conditions), and the US high school diploma, in a totally virtual format.

The objectives pursued by the school in offering this program are less about obtaining a high school diploma but rather about implementing the skills required to “live and move in the cloud”. The development of autonomy, the ability to manage one’s own time, the self-discipline to achieve goals in a timely manner, the flexibility to work in diverse digital environments, interact with people from other cultures and entirely in English, and the ability to generate peer groups for shared motivation, among others, are some of the most outstanding skills that are brought into play when undertaking this program.

Along similar lines, another program is Online College Credits (OCC), which BDS has been running since 2018 in partnership with Arizona State University. This program has two strands. One is the Early College Experience. The other is the Concurrent Courses.

Knowing and understanding the world is achieved through the contents prescribed by the curriculum that bring us closer to the history of humanity, its scientific discoveries, and artistic and cultural productions. It is also achieved by seizing the opportunities to prepare for and sit for international exams such as IGCSE, AS and Cambridge A level; by carrying out academic projects with schools in other countries; and by participating in virtual meetings on global issues such as the environment and sustainable development, world peace, the fight against hunger or drinking water problems, with schools from all over the world, too.

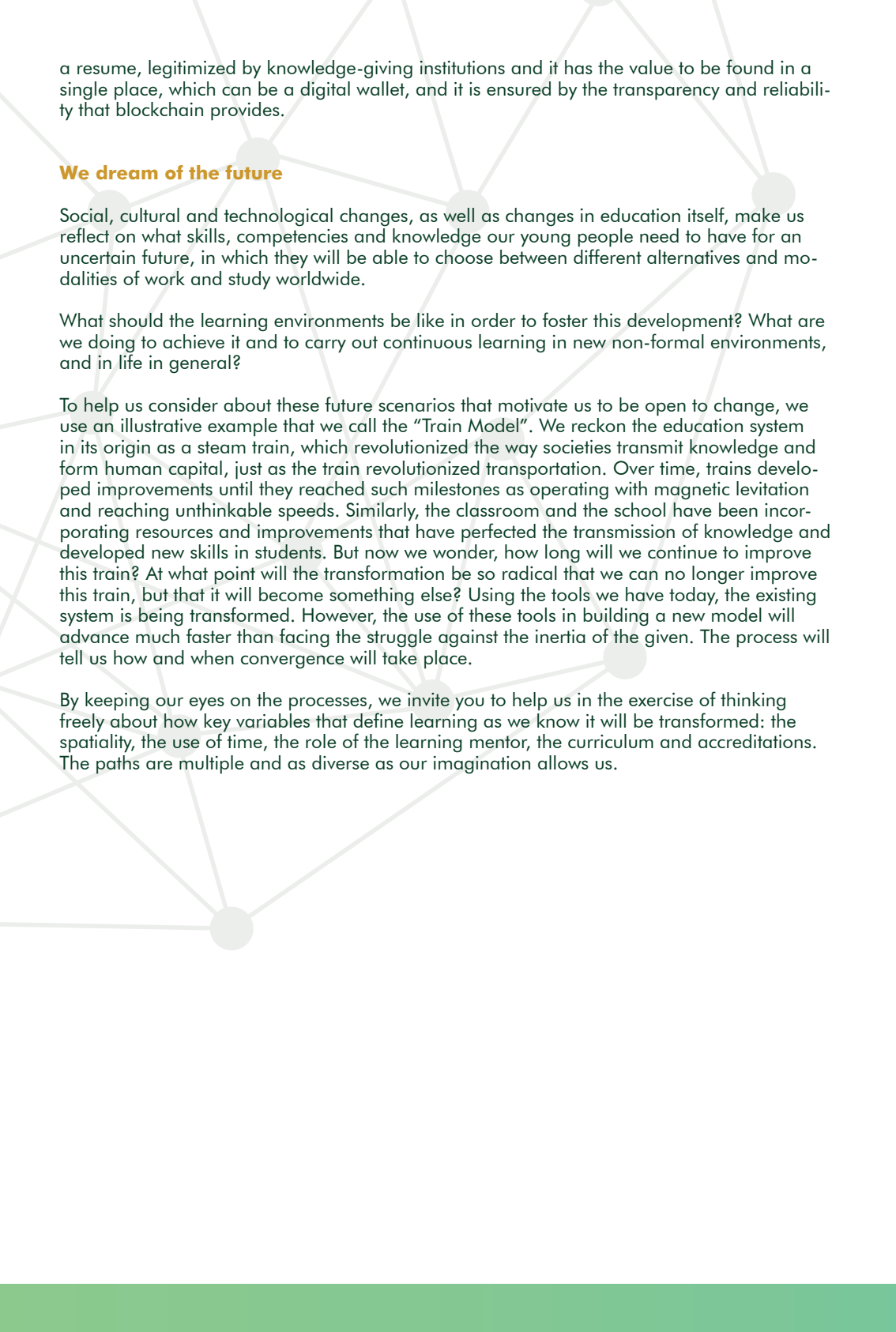
An outstanding experience in this respect is that of Global Collaborations, academic proposals in which BDS drives or participates in a shared activity with other institutions at a global level. In this proposal, students and/or teachers collaborate synchronously or asynchronously with one or more schools on projects in various subjects and, occasionally, in an interdisciplinary way. Such collaborations range from participation in a single-meeting video call to long / medium-term projects with different stages.

The international exchange program is another valuable proposal in this area. Exchange trips for Middle & Senior last approximately four to six weeks and take place during the summer break period (January-February).

For several years, we have been using the virtual learning platform for Middle & Senior to visibly show each student’s continuous progress, providing significant and constant feedback so that the final mark is never a surprise; but on the contrary, students’ strengths and aspects to be improved could be identified class by class, allowing them the opportunity to do so.

Additionally, the school performs statistical monitoring of the platform use (365 days a year, 24 hours a day) to measure how, when and how much it is used. This analysis allows us to adequately monitor school trajectories, anticipate possible difficulties and design strategies to improve our practices.

On the other hand, we have made progress in the certification of high school diplomas in Blockchain, becoming the first school in the world to do so (dated August 2019). Today, state requirements are only focused on grades and on an official degree (after a bureaucratic and long process), but we believe that it is an incomplete certification and that it reflects only a specific moment. For this reason, in line with the possibilities offered by today’s technology, we have developed that first step towards a complete, open and global accreditation system, which permits to reflect the academic life of our students to the community in a reliable, accessible and transparent way throughout their entire training stage (and which can surely be completed in their next path if more institutions join this change). For 2018 graduates, we then included the official diploma (endowing it with immutability, integrity, transparency and accessibility), with a project aimed at advancing in subsequent years in the incorporation of other skills and experiences that can be certified: participation in academic and sports competitions, exchanges and study trips, work internships, performance in artistic shows, etc. We thus create the conditions to make possible an “educational passport” that certifies people’s knowledge and competencies in a safe, reliable and public way. This educational passport acts as



a resume, legitimized by knowledge-giving institutions and it has the value to be found in a single place, which can be a digital wallet, and it is ensured by the transparency and reliability that blockchain provides.

We dream of the future

Social, cultural and technological changes, as well as changes in education itself, make us reflect on what skills, competencies and knowledge our young people need to have for an uncertain future, in which they will be able to choose between different alternatives and modalities of work and study worldwide.

What should the learning environments be like in order to foster this development? What are we doing to achieve it and to carry out continuous learning in new non-formal environments, and in life in general?

To help us consider about these future scenarios that motivate us to be open to change, we use an illustrative example that we call the “Train Model”. We reckon the education system in its origin as a steam train, which revolutionized the way societies transmit knowledge and form human capital, just as the train revolutionized transportation. Over time, trains developed improvements until they reached such milestones as operating with magnetic levitation and reaching unthinkable speeds. Similarly, the classroom and the school have been incorporating resources and improvements that have perfected the transmission of knowledge and developed new skills in students. But now we wonder, how long will we continue to improve this train? At what point will the transformation be so radical that we can no longer improve this train, but that it will become something else? Using the tools we have today, the existing system is being transformed. However, the use of these tools in building a new model will advance much faster than facing the struggle against the inertia of the given. The process will tell us how and when convergence will take place.

By keeping our eyes on the processes, we invite you to help us in the exercise of thinking freely about how key variables that define learning as we know it will be transformed: the spatiality, the use of time, the role of the learning mentor, the curriculum and accreditations. The paths are multiple and as diverse as our imagination allows us.



TIME

Standardized school day organized by course plan. The link with the classroom is restricted to that time/space. The system foresees groupings by biological age that standardize the contents accordingly.

SPACE

The classroom and the school are the privileged spaces where learning takes place. The layout of the space prioritizes attention to the teacher. Being in the institution is a condition for the accreditation of knowledge.

MENTOR/ TEACH ROLE

Teaching as a link between the teacher as a knowledge giver and students as receivers. Teacher as a habit-former and conveyor of values.

COURSE PLAN

Conditioned on the division of subjects, complexity levels sequenced and assigned to age cohorts. Local content approach.

ACREDITATION

Subject to being in the institution, complying with the time schedule (time and sequence of years), and reproducing the knowledge learned according to the standardized course plan.



Extended school day / asynchronism: the link with the class is extended outside school hours through virtual classrooms. Contents are standardized by biological age but, based on these general guidelines, work is done with personalized pathways with different scope levels according to the student's learning profile.

Will we continue to have synchronous study days? Will the new devices modify our attention and resolution time? Will the time be adjusted to the user's capabilities? Will the path through the levels of content be detached from biological age?

The classroom becomes more flexible and extends to other areas of the school environment. The virtual space coexists with the face-to-face environment. Being in the institution continues to be part of the accreditation of knowledge.

Ubiquity: learning takes place wherever a person or a group develops an activity for that purpose. Is it possible to think of multiple simultaneous spaces? Will the learning environment be separated from the accreditation criteria?

Planning of learning situations, socio-affective support, incentive to action and autonomy. Teacher's role in learning actions.

Is it possible that in the face of a fragmentation of learning time and space, the different functions currently attributed to teaching mentors will also break down? Is it possible that some of these functions will be outsourced to platforms and software? New roles reserved for human ability will appear: content curation, socio-affective support of the learning process self-management, etc.

Developed by competencies and skills with basic learning cores in age and cohort progressions. Global approach.

Is there a single course plan or can it be tailored to each person's interests and skills?

Competency-based assessment, with minimum and advanced levels of performance according to age.

Will every learner have their own portfolio, and will achievements be accreditations that can be recorded in an individual passport? Will accreditation be required as proof of educational background or upon employment entry?



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Resources:

We've been discussing about innovation in education for more than 20 years. Check our previous papers here



Website:



