teleXbe 2021 - The role of technologies in education and new trajectories of blended learning

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1. What are technologies?

What are technologies? A set of artifacts and intentionality, of projects, actions and interactions whose purpose is to produce a transformation of the environment according to man.

From this point of view, man does not adapt to the environment but modifies it through technology to make it functional. Technology responds precisely to this primary human desire to transform the environment and adapt it to their goals.

The "goodness", that is, the quality of the technology, depends on the use made of it. In general, technology is a substantially inert medium: the internet and technologies can be used to trade weapons or to start a training course for support. By itself, therefore, technology does not have a positive or negative connatation it is the way in which it is used that determines its effectiveness.

Many of the ideological battles around technologies are projections of our fears and doubts, polarizations that make no sense because, especially when it comes to the educational context, it is shared knowledge that assessments must be made on the basis of empirical evidence, facts and science, not ideological presuppositions; otherwise, it hurts the school and our children, and it betrays the teacher's task. Instead, it is necessary to overcome ideological polarizations and try to understand what a new technology can offer to schools.

Just think of the potential of video games: very powerful tools for self-learning (for many years scholars have been analysing the didactic quality of the video game), but also for alienation, solipsism, isolation and techno-addiction; it all depends on how they are used, in what context, how much they are played and by whom. It is not certain that individuals with particular disabilities or disorders will find benefit or pleasure in a videogame experience, but in itself it is a powerful technology, applicable to the educational context; it is therefore necessary to know it to understand what kinds of applications are possible.

To illustrate, think of the difficulty of giving a four- or five-year-old child a traditional tool such as a book: the child, not knowing how to use it, would not know what to do with it because he does not learn to read independently. Instead, give him a tool such as a smartphone, and within a few minutes you will see that he will learn how to use it and will immediately derive great satisfaction from it. He will understand how to use it and maybe even be able to play video games.

In the context of game learning, the child, through trial and error, will learn to play alone, while he will never learn to read alone.

What does all this mean? Technologies are engineered tools created specifically for forms of self-learning and therefore they have great potential for application in the context of the school. This does not mean that they can replace teachers or traditional teaching and learning processes; however, if used intelligently and in the right way and context, they can be great resources.

The innovation models can basically be summarized in two types: market pull and technological push.

The market pull indicates a market push, a driving of demand which, through the introduction of technologies, initiates or generates market needs. These needs translate into manufacturing, production and marketing of these products that have been made necessary, and which are then marketed.

For example: a new device is patented, such as a pair of wireless headphones or a console, and then presented to the market, produced, marketed and promoted with a large advertising campaign. Consumers are then tempted to buy it. This situation is generated by the market.

In the context of the school, this means the adoption of technology in an educational context at the request of parents or students to make the school avant-garde and fashionable.

The technological push, consequent to the progress of science, instead foresees the development of new technologies with effects on tastes and behaviours such as to induce change in a deterministic logic. The introduction of technology, in this sense, can generate change.

Science continually discovers new processes and therefore new products that do not necessarily translate into adoption and transformative processes within the school. This is visible every day: there are very well made tools that with a good marketing mechanism have entered the school (Their validity was perceived well and no support was needed for their adoption) and others that are also well made but have been ignored or rejected by the school because they were not correctly marketed.

In both these models, the appearance of a random factor is underestimated, such as the emergency experienced during the Covid-19 pandemic. If there had not been an emergency, the country system and the world of schools would not have had this very rapid acceleration in the use of technologies. This acceleration cannot fail to produce effects and transformations in teaching practices.

2. The first edition of Technology Enhanced Learning Environments for Blended Education – The Italian e-learning Conference

The First edition of "Technology Enhanced Learning Environments for Blended Education – The Italian e-learning Conference", with the acronym teleXbe 2021, was organized jointly by the University of Foggia and a company that works in the field of TEL named Smarted srl. The conference was held on 21st and 22nd of January 2021. Initially the conference was scheduled as a traditional event in presence in Foggia at the department of Humanities, but due to COVID-19 second outbreak in Italy the First edition of teleXbe was held online.

Although the call for paper was open for less than two months, the conference obtained a great success. The submitted articles are 42 and 103 are the authors involved in the papers. Out of the 42 papers, 12 of those were with a single author. Between the 42 papers submitted for peer-review to this symposium., 40 papers were accepted for this volume.

One of the reasons of the success of the conference was the choice to maintain the workshop as an open event. No fees were required for the conference participation, as authors and as well as attendees during the working sessions. This choice has a strong value, with the idea to allow an open access to the scientific discussion, with the only barrier devoted to the peer reviews for the submitted article. Each submission was reviewed by at least two international Program Committee members. To reach a final decision there was a Program Committee discussion period.

The organization of the event and openness to all the attendees for free was possible thanks to the commitment of the University of Foggia that strongly intended to bring the discussion on the topic of blended learning in an international scientific event that allowed open debates. One of the goals of the conference is to create a community of practice between researchers and professionals in this field. Thus, teleXbe conference aimed to engage researchers, practitioners, educational developers, entrepreneurs to address current challenges and advances in the field.

The Workshop was designed in order to advance a set of scientific knowledge and methodologies of intervention that can be purposefully applied to the design and development of technologies that support learning processes.

Because its open nature, the conference obtained also a great participation of public. The conference attracted a high number of attendees and on the online room where the sessions were held, we counted in the climax of the event about 500 attendees.

The event last two days allowing a right time for discussion of each paper, giving a consistent time for the open debates that emerged in a fruitful manner, proposing new contributions and the possibility to create interconnections and new convergences.

One of the aims of the teleXbe conference was to include in the discussion new and innovative solutions in the field of technology enhanced learning, also if those studies are in the first steps. The

idea behind this choice is to include the scientific vanguards on the blended education applying a TEL approach, in order to anticipate the new themes and provide the new frontiers for open discussions, characterizing the conference with an high degree of innovation.

For this reason, teleXbe workshop accepted also selected contributions concerning the development of technologies in learning environments in three levels of implementation:

- beginning phase (proof of concept),
- intermediate phase (prototypes without user-experience research),
- final phase (products adopted by end-users).

The workshop encouraged the submission of studies on prototypes at an initial phase of involvement based on the European framework of Technology Readiness Level[1] [1]. This means that also initial project placed in TRL 1 or TRL2 was accepted in order to enhance the project development. The new ideas funded a vital humus where was possible to find suggestions, comments that potentially could also prevent weak design or underestimated risks.

As previously mentioned, teleXbe aimed to promote a community of practice in this field, with a highly multidisciplinary impact offering different perspectives. The papers included in this volume cover different disciplines that have the lowest common denominator in the ICT application, as the transversal theme of the conference. It is fundamental to remark that the ICT represent the tool side, but the main asset of teleXbe conference was the methodology of application of the ICT tools in education. This naturally involves different subjects and areas as computer science, education, psychology and engineering, as confirmed by the submission made by the authors that covered of these different fields.

The topics of the conference are wide and covered contributions from the blended learning, as reported on the title, to the application of artificial intelligence in education; from the teaching, learning, and assessment strategies and practices to the new frontiers on Human-Computer Interaction. All these topics obtained an additional relevance in this peculiar historical period because of the COVID-19 pandemic. The education migrates online, provoking a little tsunami in educational practices and thus, forcing the students, teachers, lecturers and learning specialists to apply new [2] for a correct involvement of the students and the maintaining the learning aims and achievements. The development of information communication technology (ICT) offers opportunities and benefits in the educational area when blended with traditional approaches to learning/teaching are used jointly. The blended learning model is a possible solution to creating a flexible and adaptable learning environment for students' preferences and learning needs.

Another interesting specificity of the conference was the ability to join the academic world with the business sector. This element it is well represented also by the two organizers of the conference, namelye the University of Foggia with Smarted srl. The latter organization, a SME, works on the development of technology enhanced learning solutions in the edge between games for education and rehabilitation (Serious Game, augmentative and alternative communication tools AAC, multisensorial and Montessori-like applications) and the application of the Artificial Intelligence in education. The interaction between an University and a company in the field of TEL was another added value of the conference that took together two different approaches. This was also confirmed by the submissions of the papers: the majority refers to international Universities, but submitted papers included also authors from enterprises, jointly with research centres or universities. This is a strong value for the aims of the conference and for the discussion and effect in mid-term that could have.

The central word of the conference is "blended" as cited in the title. However, a synonym arose during the teleXbe discussion, namely the "hybrid" approach [3]. Hybrid that refers to the edge between different side. The main sides discussed during the conference was the dichotomy between online and face-to-face education as learning environments. An additional contrast, that could be summarized in a synthesis applying a hybrid approach is between digital and physical. Solutions brought in the conference were in this edge, promoting new solutions for the education environments, able to be more flexible, and in some cases fluid. The possibility of readaptation and the ability of re-transform the teaching/learning approaches at all level is crucial in a moment where an important impulse emerged. If this unexpected earthquake will find strong but unbending structures, it could be disruptive: these are natural candidate to fall down. But if the building can adsorb the impulses and to use it for an extra input of energy, the earthquake will become a strong opportunity.

[1] https://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf

Finally, seeking this analogy, the conference applied an innovative way to involve the participants in the coffee breaks and in the poster session. The decision was to have real interactive coffee breaks during the event using a tool for videoconference named Gather[2]. This platform allows each participant to access in a 2D space using an avatar [4]. The space is freely browsable with the avatar and it permits an interaction with objects and other participants. The videocall starts once two or more avatars are close each other. It boosts the creation of groups, or gathering, that could talk together simultaneously with a real interaction. As shown in Figure 1 the poster session was held in a digital poster room where each avatar was able to navigate the space and see the preferred poster. Close to the posters, the authors were able to give feedback about their findings or reply to questions of the researchers, as done in a face-to-face conference.

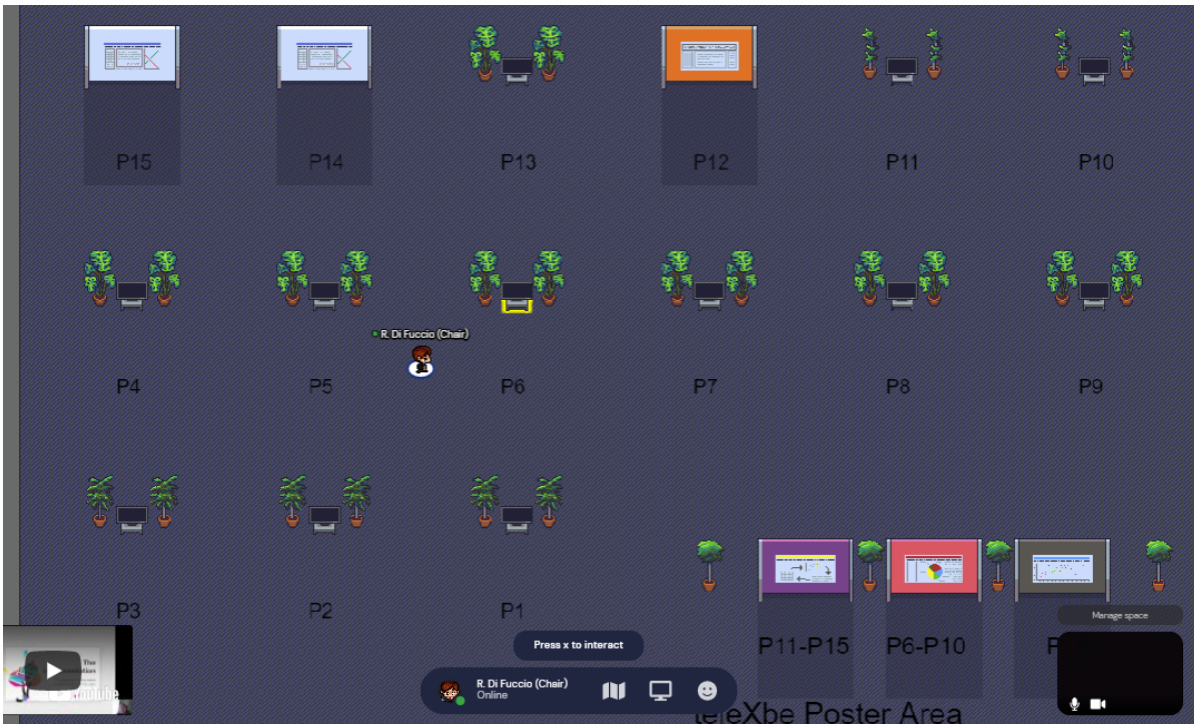

Figure 1: Poster session room

For the coffee break was designed another digital room, in connection with the poster session room, where the avatars have on the table games, videos and interactive tools in order to promote discussion and connections between researchers.

3. Conference sessions rationale

The teleXbe conference was divided in:

- Five sessions.
- One poster session.
- A dedicated session for EU funded project, called ALEAS[3].
- A session for awards.

The main idea was to group the papers with a greater scientific relevance in the virtual talks inside the 5 sessions and to place the studies and researchers that started from the initial steps in the poster session, with the modalities described in the previous paragraph. The clusters were created by grouping the papers regarding their target groups.

[2] https://gather.town/
[3] aleas-project.eu/

The decision was to keep only one open virtual room, without the application of parallel sessions, in order to do not disperse the participants into too more virtual places. The centralization aimed to promote discussion and interaction.

The first session "Distance and blended solutions in school context" included all the papers that proposed new methodologies applied to school education. This session promoted new trajectories in applying the blended learning, as a new space to be re-conceptualized.

The second session grouped all the contributions that involved solutions and studies for disabilities and special educational needs. The session was called "Technology enhanced learning approaches for special needs". Two of these studies involved application based on ICT approach for visual disabilities, on in the field of Augmented and Alternative Communication, the other applied Tangible User Interfaces paradigm [5]. The other two papers referred on the application of virtual reality and autism and Asperger syndrome.

The third session included studies that discussed on the evaluation and the assessment in the TEL field, applying the ultimate solutions of deep learning and learning analytics and was called "Assessment and monitoring of learning processes". The studies covered facial expression recognition, monitoring of students' attention during e-learning activities and practical cases of application digital learning approach using innovative solutions.

The fourth session focused the attention on a different target group, namely the university courses for training education applying distance and blended learning in response to the COVID-19 pandemic. It was named "Innovative learning environments in academic training courses". The studies focused on the effects of distance learning on achieved skills.

Finally, the fifth and last session, discussed on technology enhanced learning environment in higher education. The session was called "Hybrid higher education frontiers". This call contained both studies on students' perception about distance learning and reflections on how apply and certify learning with a hybrid approach.

After the five sessions described above, was organized the poster session for 15 papers using Gather platform, allowing a strong interaction between posters' presenters and attendees.

Next, teleXbe included a session for the dissemination of a consortium for a research project funded by the European Union, ALEAS (Adaptive LEArning in Statistics). It is funded in the Erasmus Plus KA2 –Grant Agreement n° 2018-1-IT02-KA203-048519. The core of the ALEAS project is the development and implementation of an adaptive learning system that will be realized exploiting the most innovative and digital technologies embedded in an open access framework (MOOC), by developing an APP[4] for statistics exercises based on the Adaptive Tutoring Systems.

At the end of the conference three awards were assigned. The first award is named "Best paper award Antonio Cerrato". The award was dedicated to the memory of Antonio Cerrato and its passion for research in Technology Enhanced Learning that drove its academic path. The aim was to reward the author/s of the most innovative research based on the judgment of the Program Committee.

The Program Committee selected five papers under three dimension that are scientific relevance, innovation and potential impact.

The five finalists were:

- Andrea Generosi, Silvia Ceccacci, Giampiero Cimini, Samuele Faggiano, Luca Giraldi and Maura Mengoni: Facial coding as a mean to enable continuous monitoring of student's behavior in e-Learning.
- Concetta Pirrone, Simone Varrasi, Giuseppe A. Platania and Sabrina Castellano: Face-to-face and Online Learning: The Role of Technology in Students' Metacognition.
- Thomas Sofias and Christos Pierrakeas: Effectiveness of a WebGIS-Based Project on High School students' Spatial Thinking Skills.
- Isabel de Maurissens and Nicola Barbuti: Ontology of Backgrounds in distance learning. Correlations between virtual Backgrounds and educational relationship.
- Giorgio Ciano, Giovanna Maria Dimitri, Alberto Rossi, Giorgia Giacomini, Simone Bonechi, Paolo Andreini and Elisa Messori: SlAide2Voice: a new educational tool for students with visual disabilities.

[4] https://play.google.com/store/apps/details?id=it.smarted.aleas&hl=en_US

The Best Paper Award - Antonio Cerrato was assigned to Concetta Pirrone, Simone Varrasi, Giuseppe A. Platania and Sabrina Castellano. The winning paper was awarded a prize of €200.

The other two awards were the lifetime achievement awards and were assigned to two important researchers in two different fields: education and psychology.

The lifetime achievement award in education was awarded to Prof. Nicola Paparella and the same prize for psychology was awarded to Prof. Orazio Miglino.

The hope for the second workshop 'First Workshop on Technology Enhanced Learning Environments for Blended Education - The Italian e-learning conference' is to take stock of the results of the experiments conducted in the last year and to shed light on the strategies to be used post-Covid.

4. References

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