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Strategic Path

Like we explained, different studies show that ICT as a tool facilitate the adaptation of teaching to each student. Some other shows that this is because they can promote collaboration, interactivity, the use of multimedia codes, and greater control of learning by the learner and most of them agree in that their integration in the curriculum would contribute to the acquisition of 21st-century competencies (autonomy, collaboration, critical thinking, and problem-solving) that the OECD links to the so-called “global competence” that should define the current education.

However, after decades of use of ICT in classrooms, they have not fully achieved their promise to transform teaching and learning processes it is why it is necessary to use agile methodologies like Scrum combined with ICT to promote the acquisition of 21st-century competences with special focus on: students coming from minorities or immigrants’ families, due to linguistic and cultural obstacles, students with learning disabilities that need special support and attention and students coming from disadvantaged social and economic environments and/or less developed areas
In the field of Teaching Innovation some pedagogical efforts towards innovation are worth of mention: e-learning (Tavangarian, Leypold, Nölting & Röser, 2004), blended learning or b-learning (Bartolomé, 2004) and mobile electronic learning or m-learning (Crompton, 2013). In the first modality, learning is online via Internet, this being an utterly virtual training which develops autonomous learning. B-learning, on its part, refers to semi-online learning, that is, a mixed option combining e-learning strategies and traditional face-to-face training. B-learning can also include m-learning, developing groupwork by constant communication. The use of electronic devices such as tablets and other technologies can be an extra motivation to reinforce positive predisposition of students towards the subject contents, especially when courses are mostly developed via lectures. Group dynamizers or routine breakers constitute another innovation line at university level (Muñoz-Luna, 2014), More specifically, the aim is to effectively increase learners’ attention span, what has also been demonstrated by Hull (1984). Moreover, significant effort by teachers is directed towards learning-by-doing activities. With these strategies, students learn in a more meaningful manner since they experiment with and recreate the concepts they are learning. Real-life scenarios are simulated in realistic laboratory contexts so that conditions are appropriate. Thus, several experiments could be implemented (Jurado-Navas, Muñoz-Luna & Taillefer de Haya, 2014). The employment of virtual platforms and portfolio (Biggs & Tang, 2011) constitutes another means of innovation in teaching by developing critical and reflexive skills in students, and not only memoristic learning. In this case, Mahara portfolio (https://mahara.org) has been employed by the subjects of this experience.

Project-based learning (PBL) is a student-centred learning method focused on the development of a project in a real professional context, in which teams of students solve an

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interdisciplinary problem, articulating theory and practice during the development of a project (Graaf & Kolmos, 2007) (P. Powell & Weenk, 2003). Other characteristics of Project-based learning can also be referred as being focused on the integration of several knowledge areas (including technical and transversal skills) for solving a problem linked to real situations, during a long period of time (e.g., a semester), resulting in a specific result (Helle, Tynjälä, & Olkinuora, 2006). The students develop several competencies: Knowledge, Skills and Attitudes when they go through PBL experience in real context (Lima, Dinis-Carvalho, Sousa, Arezes, & Mesquita, 2017). Project based learning using real world problems and context is believed to motivate students to identify and apply research concepts and information.

Agile methodologies can be effective, especially where active and project-based learning can be applied. According to Agile, teachers become facilitators, coaches for students that are self-directed learners. The core of this Agile methodologies consists in understand that the focus is not on rigid plans, rather flexibility is required to take into account students' feedback and their different abilities, interests, difficulties, and experiences, aiming at unlocking their hidden strengths and passions. The emphasis in these Agile methodologies is on delivering the highest value, in terms of both course-specific learning outcomes and soft skills such as organization, planning, collaboration, and teamwork.
Distance education (virtual learning education, e-learning courses) has been applied in the past to various groups of students such as students with mental or physical ailments, students that are athletes, students that they are attending to courses only from distance and their parents pay cheaper school fees. Therefore, there is some kind of expertise in creating and running distance learning courses well. Additionally, there are many factors that determine the success or failure of a virtual course, such as the virtual tools the teacher will use, digital subscriptions, practice software and broadband connection. For educators new to distance education, it can be difficult to know which online teaching techniques work best or even where to start. In the following paragraphs is analyzed strategic paths and online teaching strategies.

1. Virtual tools, e-learning tools, distance education tools

The main tool of the distance education courses of the educators will be the Learning Management System or LMS, plus an extra videoconference tool for the live lessons and video chatting.
The suspension of in-school learning caused by the COVID-19 pandemic started a dramatic shift in the way teachers and students at all levels interact with each other and learning materials. UNESCO estimated that as of May 25, 2020, approximately 990,324,537 learners, or 56.6% of the total enrolled students have been affected by COVID-19 related school closures. In many countries, online education through the use of Learning Management Systems became the focal point of teaching and learning. For example, statistics taken from a university's LMS during the initial school closure period (March to June 2020) indicate that

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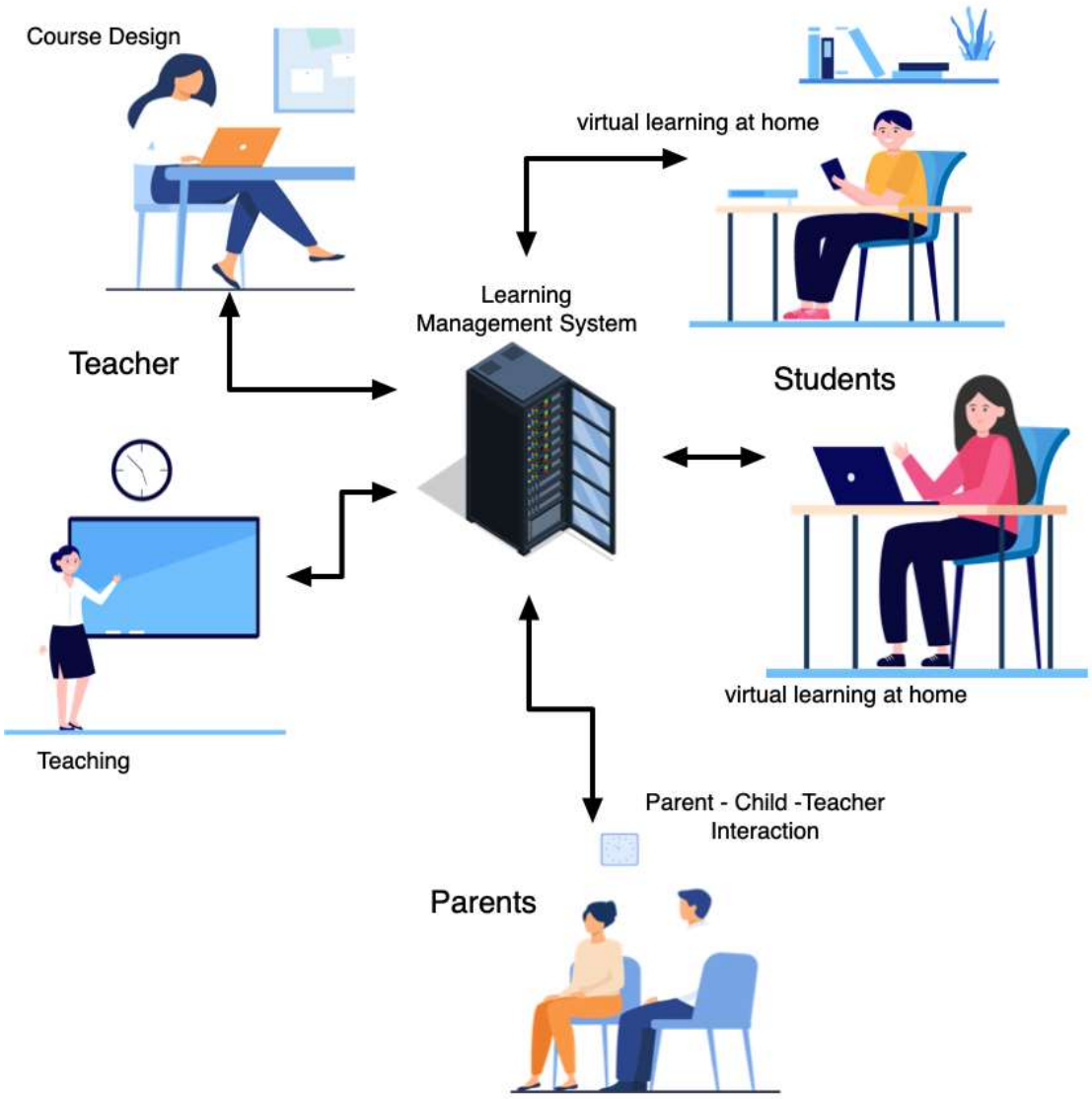
student submissions and activity nearly doubled from pre-pandemic usage levels. (Wikipedia).

Student satisfaction with LMS usage during this period is closely tied to the information quality contained within LMS modules and maintaining student self-efficacy. From the teacher perspective, a study of K-12 teachers in Finland reported high levels of acceptance for LMS technology, however, training support and developing methods for maintaining student engagement are key to long-term success. In developing nations, the transition to LMS usage faced many challenges, which included a lower number of colleges and universities using LMSs before the pandemic, technological infrastructure limitations, and negative attitudes toward technology amongst users (Wikipedia).



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Examples of Learning Management Systems:

- Chamilo LMS, Open-source LMS, that improves access to education. Backed up by the Chamilo Association, aiming for promotion of the software, maintenance of a clear communication channel and building of a network of services providers and software contributors.
- Moodle LMS, an open source LMS widely used worldwide. It's secure and scalable, integrates seamlessly with third-party platforms and plugins, and allows teachers to create engaging, accessible, and active learning experiences.
- Claroline Connect, An eLearning platform designed by teachers, resulting in a reliable software for your online training. Downloadable, free of charge, supported by a community of users and developers. Accompanied with service, plus offering support for schools.
- Open edX, The Open edX platform is a leading open source LMS that powers edX courses. It is highly scalable, reliable, and customizable to meet any institution's online learning deliverables.

(*) this short list of LMS contains LMSs that are free of license and are open source, of course there are a lot of other LMS that are free, open source and paid.

Examples of videoconference tools:

- Zoom, Zoom Meetings' claims to fame are top-notch performance and a generous free plan. Paid plans are competitively priced, and they include a wealth of additional features.
- Webex, Webex is a feature-rich video conferencing service that lets your business leverage Cisco's compelling hardware ecosystem—if you have the deep pockets to justify it.
- Skype, Skype is a free web-based communication tool which allows people to video conference, make calls, and instant message.
- Microsoft teams, Microsoft Teams provides features galore, including tight connectivity with other Microsoft apps. It's a good team messaging and video calling app if your organization is a Microsoft shop.
- Google meet, featuring a robust free tier, collaboration tools, and automatic meeting recording, Google Meet is an excellent video conferencing app, especially when integrated with Google Workspace.
- GoToMeeting, despite a few quirks and omissions, GoToMeeting includes many tools that make it a useful video conferencing app.

2. Online teachers

Teachers have to realize the difference between the traditional face-to-face course and online course. They should make more effort to achieve the objectives of an online course.

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Firstly, they should adapt their lessons to work online, set clear expectations to students and their parents, build a strong online community, keep parents involved with frequent and engaging communications, search and find the most suitable tools for their classroom.
The educators should also adapt their lesson paths and plans to different types of learners. They can add discussions to increase engagement and comprehension. The discussion boards can be asynchronous, recorded messages, posts, synchronous discussions.
They can utilize screen recordings to pre-record their self and their lessons. So, they can upload their videos to the LMS document library, and the students can download them. The Educators can also video record their-selves by giving to learners some instructions and directions to the course.

Furthermore, teachers should have in their mind to make the lessons as interactive and engaging as possible. They should include to their courses: drawings, quizzes, polls, collaborate boards. If they have the development skills, they can create gamification learning patterns. Gamification is the art of applying game mechanics to real-life scenarios (like teaching in a classroom) to drive more meaningful engagements. Gamification works for classrooms for the simple reason that it makes learning more fun. A fun learning environment means curious learners who are more willing to participate and thus learn creatively.

Finally, it's important to find a connection point with the other colleagues. Educators can be easy feeling isolated working home alone, but they should remember to reach out and ask what their fellow teachers are doing in their virtual classrooms. They're all researching and testing out new strategies and tools, and sharing their mutual findings benefits everyone.

3. Expectations

Clear and simple expectations give success. Strong classroom management is just as important in the online environment as it is in the traditional one. The educators should make rules/expectations clear from the outset, especially in live discussions. They should also set and enforce consequences in live discussions. They should also set clear due dates.
Additionally, educators should find an "on-line" way to reward their students. Some ideas could be:

- Recognize star students in theirs emails to the class, during synchronous lessons, or post them on a public board.
- Send students and their families' individual messages when they've done good job.

4. Types of Lessons

The teaching should be a blend of synchronous and asynchronous. Synchronous teaching through phone calls, videoconferences, live chats. Asynchronous activities, like discussion boards, forums, announcements, recorded lectures, glossaries, useful links, document libraries, calendar, surveys, wiki, notebooks, interactive tech tools, allow students to complete assignments at their own time and pace.

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5. Communication with the parents

Educators should communicate often and regularly with the parents. The teachers should also make parents feel free to ask them at any time whatever they want, they should know the email and phone number of every teacher. Parents should feel comfortable with the teacher and have no doubt that the online course of their child is being done correctly. Educator should organize weekly newsletters and personal phone calls to the parents throughout the school year.

Additionally, teachers should send frequent reminders to parents about class events, times, locations, links to resources, videos, articles.

They should also discuss parent expectations like:

- Checking their child's due dates and what they've submitted each day
- Checking the posted grades for each class
- Reading and responding to teacher emails and calls
- Reaching out with any questions or challenges

6. Common Virtual Learning Issues

Many times, teachers, while being prepared for their lesson, face various difficulties during their online teaching. Most of the problems are easy to be fixed, but the teacher should be patient and with the help of the IT person should solve any issues.

The following list shows some of these:

- Connectivity problem, students may have issues connecting to the virtual learning rooms.
- Technical difficulties, there are compatibility issues with operating systems, browsers or equipment.
- Boring lessons – boring students, many virtual learning issues begin with the never-ending text slides that feel more like a talking head than actual virtual engagement.
- "Too much" Human interaction, students still want human interaction, with the ability to have conversations with their facilitator and peers.
- Distracted students, at home, students are surrounded by a host of distracting things. The level of distraction increases the longer the session goes.
- Not testing new tools (for teachers), teachers should try out a new tool for the first, before adding it to the online session.

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