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Learning cyberculture in graduate classes using 'whatsaula'

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ABSTRACT. This article addresses the use of mobile devices in the learning process. It shows, from activity training, that the virtual communication application WhatsApp can be used as an enhancer in graduate classes, allowing the exchange of information between them, sending text, video, audio, and images, something versatile for accessing the involvement of graduate students with formal knowledge and among them, the teacher (facilitator), dynamically and innovatively, using this resource as a teaching strategy in extra-class classes. Discusses interactivity in an inverted classroom proposal '*whatsaula*' (Alves, Porto, & Oliveira, 2019) involving the debate of two videos at various interactive moments in a *Strictusensu* graduate course. It analyzes the contributions of WhatsApp as a support application for learning processes and '*whatsaula'*as a viable pedagogical proposal in extra-class contexts.

Keywords: WhatsApp; *whatsaula*; interactive classroom; pedagogical practices.

Aprendizagem na cibercultura em aulas da pós-graduação utilizando 'whatsaula'

RESUMO. Este artigo aborda o uso de dispositivos móveis no processo de aprendizagem. Mostra, a partir de uma atividade formativa, que o aplicativo de comunicação virtual *WhatsApp*pode ser utilizado como potencializador nas aulas da pós-graduação, permitindo a troca de informações entre eles, envio de texto, vídeo, áudio e imagens, algo polivalente para o acesso do envolvimento dos pós-graduandos com o conhecimento formal, e entre eles e o docente (facilitador), de maneira dinâmica e inovadora, adotando esse recurso como estratégia de ensino em aulas extraclasse. Discute a interatividade numa proposta de sala de aula invertida 'whatsaula' (Alves, Porto, & Oliveira, 2019), compreendendo o debate de dois vídeos em vários momentos interativos numa disciplina da pós-graduação *stricto sensu*. Analisa as contribuições do *WhatsApp*como aplicativo de suporte para processos de aprendizagem e da 'whatsaula' como proposta pedagógica viável em contextos extraclasse.

Palavras-chaves: *WhatsApp*; whatsaula; sala de aula interativa; práticas pedagógicas.

Aprendizaje en cibercultura en clases de posgrado utilizando '*whatsaula*'

RESUMEN. Este artículo aborda el uso de dispositivos móviles en el proceso de aprendizaje. Muestra, a partir de una actividad-capacitación que la aplicación de comunicación virtual *WhatsApp*, puede usarse como un potenciador en las clases de posgrado, permitiendo el intercambio de información entre ellos, enviando texto, video, audio e imágenes, algo versátil para acceder a la participación de estudiantes graduados con conocimiento formal y entre ellos, el maestro (facilitador), de una manera dinámica e innovadora, utilizando este recurso como estrategia de enseñanza en clases extra. Discute la interactividad en una propuesta de aula invertida '*whatsaula'*(Alves, Porto, & Oliveira,2019) que involucra el debate de dos videos en varios momentos interactivos en un curso de posgrado *Strictu sensu*. Analiza las contribuciones de *WhatsApp* como una aplicación de apoyo para los procesos de aprendizaje y '*whatsaula'* como una propuesta pedagógica viable en contextos de clase-extra.

Palabras clave: *WhatsApp*; '*whatsaula'*; aula interactiva; prácticas pedagógicas.

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Introduction

The use of digital information and communication technologies (ICT) as a pedagogical resource is part of the routine of many teachers, and the form, method, and resource used depend on the subject and the

objectives proposed in the course plan. According to Oliveira Neto, Versuti, and Vaz (2016, p. 228), "[...] virtual social networking applications, available for smartphones, can be teachers' allies to stimulate teaching-learning. Especially for young people, interactivity has become fundamental".

Keeping up with the technological immersion has not been easy for educational institutions, which face daily challenges imposed by this trend. However, they cannot adapt to this new scenario as quickly. Inserting the DTIC in pedagogical practices has become necessary to higher education institutions (HEI) due to the spread of technological artifacts in practically all social spheres.

In recent decades, the evolution of ICT at the service of education has been accompanied by significant behavioral changes, led mainly by the younger generations. Mobile technologies, such as cell phones, smartphones, and tablets, are responsible for breaking the limits of time and space, consolidating a new paradigm of collaborative content production. Cell phones are widespread and constantly take our attention or even generate much controversy when used in the school environment.

Students who enter the HEIs are connected to the current DTIC and social networks; they communicate all the time and all the moment; they are curious and dynamic, multitasking, different from the students' profile of times past. Knowledge, which used to have a set time and place, is now perceived, enjoyed, posted, and improved with such speed that teachers, who used to spend so much time adapting themselves to the norms and rules required by educational laws, do not know how to discipline and work the knowledge of their students in this new interactive context.

The use of cell phones has been a constant in the university environment, being a phenomenon present in the context of cyberculture (Lévy, 1999; Lemos, 2015), understood by Santos (2014, presentation) as "[...] contemporary culture, in which communication, production and network circulation of information and knowledge take place in the city-cyberspace interface, thus emerging new spatiotemporal arrangements and, with them, new educational and training practices".

With the popularization of mobile telephony and WhatsApp present in most students' daily lives, the use of m-learning as a teaching, research, and adaptation resource by all those who participate in the process is a reality. In this article, we report an experience involving didactic sequence with ubiquitous learning (Santaella, 2013) using the WhatsApp application, an instant messenger that allows the creation of groups, sending messages with photos, images, videos, and audio, involving online mediation processes, in a use that can potentiate learning at any time and anywhere, making teachers enjoy the didactic materials capable of posting videos, message and photos and, at the same time dynamically, encourage the student to use the DTIC in a way that benefits their learning.

According to Oliveira, Medeiros, Leite, and Anjos (2014), mobile learning is a teaching modality in which devices are used inside and outside the classroom to assist learning. Therefore, students and teachers can enjoy teaching materials of various formats, at any time and anywhere, and the numerous technological resources offered in this new format.

It is necessary to plan strategies so that young people, who daily deal with their cell phones loaded with applications connected to the internet and various social networks, can direct their attention to learning. According to Pretto (1999),

> [...] we live in a society called generalized communication or network. Moreover, this society gives rise to students thirsty for the inclusion of these media in school. The students are the so-called digital natives because they were born and raised using countless technologies, such as video games, the Internet, cell phones, MP3, iPod, etc. (Pretto, 1999, p. 32).

According to Silva (2002),

> [...] from a mere transmitter of knowledge, the teacher should become a formulator of problems, a provocateur of questions, a coordinator of work teams, a systematizer of experiences, [...] who values and enables dialogue between cultures and generations (Silva, 2002, p. 70).

The teacher, in this context, has a different look at the potential that the use of mobile technologies can bring to the context of his classes: a variety of dynamics, participation, and, above all, interaction on various topics in groups and social networks. Suppose the teacher knows how to plan and execute a class using the cell phone and social networks as a didactic and pedagogical support resource. In that case,they can promote debates and rich discussions about the class topics. The class group can create moments of interaction of information and knowledge about specific subjects and out-of-class exercises.

WhatsApp as a resource for interaction and learning

WhatsApp is a multiplatform application that allows exchanging messages via cell phone. All its users can create groups of up to 100 people, send messages with images, videos, and audio, back up the content posted in the group, and share the location. It is one of the most requested applications in the world. A simple message exchange can add new layouts and ideas, making it very easy to exchange and share videos, photos, and voice messages.

According to Alves, Porto, and Oliveira (2019, p. 222), with WhatsApp or other social networks, students can "[...] access, produce-sharing any content, communicate with peers or other people." WhatsApp is an attractive pedagogical resource, allowing users to share their doubts and discoveries with better interactivity between classmates and teachers and in groups with the same objectives. It will enable working with textual multimodality since, through the application, text messages, audio, images, or videos can be sent or received. According to Alves, Porto, and Oliveira (2018), WhatsApp

> [...] is the space where subjects meet and intend to meet with a common goal: learning. That said, the device also plays the role of protagonism; instead of clustering the network, it becomes the sociotechnical network itself or an actor-network that enables ubiquitous learning through an app-learning experience (Alves et al., 2018, p. 168).

According to Oliveira et al. (2016, p. 229), "[...] social apps, such as WhatsApp, provide the ease and degree of interactivity needed as a method to stimulate students to learn, motivating new forms of relationships in the teaching and learning process."

There are some challenges to be overcome in this context, such as the excess of messages and the time it takes to follow them, the inappropriate use by students, and the excessive exposure of their personal lives. According to Oliveira et al. (2016, p. 240), WhatsApp should be used in teaching "[...] obeying a judicious planning that justifies and enriches the connection of the taught content with the media, thus reflecting a coherent and meaningful pedagogical action."

Alves et al. (2019) adopted WhatsApp as a pedagogical strategy in face-to-face and online contexts, calling it 'whatsaula,' and when hybrid, demonstrating the viability of using the app in different pedagogical proposals, allowing the construction of knowledge, besides "[...] transforming informal and non-formal moments and spaces into formal learning opportunities" (Alves et al., 2019, p. 223). The proposed use promotes "[...] ubiquitous communication and interaction, move classes, enrich pedagogical practice, and resignify teaching and learning processes, making the class engaged" (Alves et al., 2019, p. 227).

Use of 'whatsaula' in a formative activity in graduate school

Mobile technologies (Santos & Porto, 2019) have become an integral part of contemporary society, and every day they become more digital. According to Castells (2005), as the time of individuals is even more connected to communicative networks and their impacts have been causing significant changes involving new patterns of conduct and attitudes, this contemporary society requires the creation of a new concept of the university and, above all, of teaching aimed at young people and adults.

To Alves et al. (2019, p. 233), "[...] social web applications allow a coauthorship where people communicate, exchange information and interact [...]", promoting interaction between groups of students and teachers. Higher education teachers must reflect on their pedagogical actions to understand teaching, valuing the practices and learning that take place inside and outside the university context, broadening their horizons regarding the new technological forms that can be mobilized to overcome learning difficulties and lack thereof of motivation.

During the offering of the discipline Methodology of Higher Education with ICT, taught to postgraduates of the Master's and Doctorate in Education of the Federal University of Alagoas (UFAL), we developed a proposal for a non-contact class, from the perspective of the flipped classroom (SAI) as a sustained and active methodological proposal originating from hybrid education (Bacich, Tanzi Neto, & Trevisani, 2015; Horn & Staker, 2015), which allows prior study as a motivating learning process for the participation of students in an active context.

SAI is an e-learning modality in which the content and orientations are worked online. The class becomes the place to develop the studied contents, performing practical activities such as problem and project solving and group discussion (Santos, 2013). The teacher is the supporting actor who stands beside the students as a learning guide.

Hybrid education mixes moments in which the student explores the content and instructions using ICT and others in which the teaching takes place in a classroom, being able to interact with other students and the teacher. The face-to-face part counts on the teacher's supervision, who values interpersonal interactions and complements the online activities, providing a more efficient, engaging, and personalized teaching and learning process.

The inversion of the classroom, according to the Flipped classroom field guide report (2014), involves classroom activities that require a significant amount of questioning, problem-solving, and other active learning activities, forcing the student to retrieve, apply, and extend material learned online; receiving feedback from students immediately after the face-to-face activities are completed; encouraging students to participate in both online and face-to-face training, which are computed into the student's formal evaluation.

We used the 'whatsaula' proposal (Alves et al., 2019), discussing the theme 'Higher education in the digital culture. The basis of the discussion was the videos Digital Nation (GNT, 2020) and Bridging our future (INTEL, 2017) by Intel, made available on the discipline blog.

The documentary Digital Nation (GNT, 2020) analyzes life on the virtual frontier: it shows schools with multimedia education, the consequences of the digital revolution, and the social changes that have occurred since the internet. It presents a study of the use of the internet nowadays, whether in the academic, social, residential, or family environment. It shows teachers' difficulties in disconnecting students from social networks to connect them to classes. Discusses the meaning and implications of living in the digital world and the impact of constant connectivity and human, professional, and leisure relationships in this context. It portrays new scenarios, presenting the insertion of ICTs in the domestic space to realize simple everyday things and questioning whether they serve to unite or even distance at certain times.

In the documentary, some teachers are against it, and others favor the constant use of ICT in the classroom. Still, others claim that they take the attention away from what really matters and that multitasking students cannot effectively assimilate what is being discussed in class because they are immersed in the digital world every day and become unaware and isolated in their world. As an agent who renews his practices, the teacher must be involved in the digital culture, in which college students are subjects that receive, transform, and discard information very quickly.

The documentary begins when the film's producer relates that the idea to research our relationships with technology occurred to her after observing her family. The older son was playing with a laptop, and the two younger ones were playing on their mother's iPhone while her husband was working on the computer. All gathered in the living room, but none seemed to be there. She starts from this point by investigating what kind of relationship we are creating with ICT.

This context allows us to reflect on the use of ICT in various scenarios: personal life, work, education, and even war situations. The changes that social relations have acquired with the DTIC, the interactions are more dynamic, fast, and diversified, and people can communicate with more people in different places; this has repercussions in higher education, as the students are immersed in the digital culture.

However, in the classroom, it is necessary to use ICT appropriately to increase the student's engagement and improve their performance in specific knowledge domains. Otherwise, they become dispersed and often do not pay attention to the content taught by the teacher. This is because, while the teacher is explaining the subject, the student may be reading e-mails, playing games, using a chat room, surfing social networks, watching a video, listening to music, or simply performing several of these tasks at the same time.

The second documentary, Bridging our future (INTEL, 2017), brings a new reality to the classroom, presenting completely digital and interactive classes, making it possible for students to put the acquired knowledge into practice. In the video, it is clear that technology helps a lot in the classroom by showing that it helps students think about problems and the solutions to them through simulations and contact with professionals. However, in this same technological classroom, the teacher can see the participation and production of each student, valuing those who can participate more to the detriment of those who cannot participate as much.

The video shows classroom situations with gamified technologies focused on collaborative and individualized learning. It shows the functioning of a classroom supported entirely by ICT. It draws attention to how it happens and how the teacher can track participation from the screens.

In a scenario of an ICT-mediated classroom, the video presents the construction of a bridge project centered on collaborative and individualized learning. In this scenario, the teacher shows students the tasks to design the bridge: conduct the online simulation of the bridge, interview an engineer; create a bridge

design; build a model (prototype); participate in a competition. Moreover, students' autonomy in tasks and familiarity with ICT are observed. However, the teacher's attention in monitoring the activities developed in the classroom and the support in performing the tasks was noted, by showing, through images, the structure of the bridge and following the interaction of students with the engineer via chat. The collaborative work of the students in developing a model of the bridge, the tests carried out using a simulation application, and, finally, the construction of the physical model and the competition between the teams in the final stage of the project are highlighted.

In the video, technological innovations aid teaching in a playful manner, and the teacher instills the students' questions to encourage teaching and research through gamification in education.

In this SAI experience, the analysis of the videos and discussion in the WhatsApp group WhatsApp 'Met was proposed. Ens. Sup. TDIC 2016.2', composed by the professor of the subject and nineteen master's and doctoral students, involves several aspects: contextualization of the documentary and video; relation of the contexts presented with higher education; repercussions in the pedagogical practice of each one from two situations chosen in the videos; strategies to 'disconnect students from social networks or TDIC, to connect them to classes'; use of TDIC for the benefit of classes in higher education.

The four debate moments of the WhatsApp activity had their interactions recorded in a doc file at the end of the debate.

In the first moment, which had the participation of students until 4 pm on the first day of the activity, the debate was proposed based on the analysis of the videos and answers to the questions: What caught your attention in the videos about the contexts presented? What are the repercussions of higher education? In the analysis of the answers, we highlighted the following aspects discussed by the group:

-Cultural clash of generations - Digital Nation (GNT, 2020) shows various looks, among them those of families, evidencing that people today no longer interact, but each member employs most of their time using distance interaction devices;

-The videos show how ICT has transformed human behavior in several social instances, leading subjects to reflect on how they live, learn, and teach and demand rapid changes. Classes have changed, and teachers need to show more engaging content than what appears on the screens.

-Changes in interpersonal relationships through the digital revolution - people are in a different space and time, and the situations experienced in the digital world are different. Personal relationships are affected because of the shallowness of knowledge, the volume of information that flows, or the divided attention.

The videos show what is happening in various countries with the new generations living immersed in the digital world. Researchers from several areas approach themes such as multitasking students, effects on the brain, behavior disorders caused by the indiscriminate use of ICT, interpersonal relationships and bonding, virtual world, 3D, games, losses, and gains in this new social configuration.

This immersion has many advantages and negative consequences, especially for children and teenagers. Spending many hours in front of a computer screen can lead to compulsion and addiction. Adolescent video game addiction is considered a real public health problem. As an alternative to fighting compulsion, children could learn how to use the Internet responsibly from elementary school and acquire healthy habits.

- Multitasking - characteristic of the digital generation, in which the subject can do several things simultaneously. In higher education, the repercussion already appears in students, as reported by MIT professors: the student believes he can answer e-mail while attending class, but his academic performance drops.

Studies with multitaskers show that several activities performed simultaneously do not present the same quality when done individually, indicating a loss of focus and attention on what is achieved. This fact becomes a dilemma when entering the educational field because there is no denying the use of the potential of ICTs, understanding that they can also serve as a distraction when concentrated attention is needed.

The documentary Digital Nation (GNT, 2020) shows that multitasking can bring negative consequences, as the ease of access to ICT has hindered the concentration, attention, and development of studies by the student, who is constantly occupied with non-teaching accesses made available by them.

The multitasking generation presents itself as a challenge for teachers, who need them to connect to classes and learn important content that will enable their advancement in HEI and life.

-Internet ethics- the importance of children and young people learning to be ethical before using the internet or concomitantly. With the study of ethics in technology, several problems shown in the videos can be circumvented. The subjects are living the crisis of ethics; many believe that the internet is a lawless space and that they can do whatever they want.

-Teachers' preparation to use ICT in the classroom - the videos highlight the possibilities of activities the teacher can use in knowledge construction and student learning. They show the difficulties that teachers face, as they cannot disconnect the students from the virtual world and involve them in their classes, as well as modify their pedagogical practices in a way that they can articulate the DTIC, creating a link between what the students learn alone on the internet and what they will learn in the classroom in the presence of the teacher.

Many challenges are presented to teachers in organizing an efficient didactic sequence: trying out materials, reading texts, and getting to know videos. All areas have numerous perspectives for exploration using ICT and communication and socialization interfaces rich in materials, such as digital portfolios, electronic murals, blogs, and open educational resources (OER).

-Collaborative and cooperative construction of learning- addressed in the video Bridging our future (INTEL, 2017),in which students stop thinking about more individualized activities, requiring new knowledge in the realm of relating, as they do increasingly collaborative activities. Working with other students requires creating a relationship of trust, allowing them to share complementary work and knowledge in collective intelligence, or simply divide the job to finish faster.

The interventions, in the first moment of the 'whatsaula,' were very rich and the points highlighted brought contributions to the participants concerning the view of teaching in higher education, which led them to think/rethink their practices in the face of the contexts worked on in the videos analyzed in the activity.

In the second 'whatsaula' moment, the post-graduates were asked to highlight in the videos situations that could change or improve the pedagogical practice of teachers and the learning of higher education students. The time available for this second debate was from 4 pm on the first day until the end of the second day and the main points discussed were:

- Using ICT consciously and innovatively- involve various resources, teach higher education students how to filter online information, which data is reliable, and which sources have scientific validity. There is hazardous material and texts of dubious quality on the Internet, and teachers often do not teach students how to filter this material or be shrewd in these searches. This ability to select quality material for a thesis or a seminar is a challenge because the materials that students are accessing are questionable, without considering plagiarism or copies without analysis and contextualization.

- Student interaction from the Bridging our future video (INTEL, 2017), in which there is engagement to achieve together the proposed goal of building the bridge. This is repeated at the end of the documentary Digital Nation (GNT, 2020) when it is shown the interaction of people from various parts of the world making the interlocution to achieve their goals in online games.

- Collaborative learning - using ICT with challenging, interesting, motivating proposals leads students to think and engage in learning by discovery, investigation, or problem-solving. In education, the important thing is the process of learning, of experimentation. Suppose the teacher expects students to be proactive. In that case, he needs to adopt methodologies in which they participate in activities that require them to make decisions and evaluate the results with the support of relevant materials.

- Problem-based learning - the video Bridging our future (INTEL, 2017) shows how this strategy instigates the student to think, seek ways, reflect on the problem, and interact with peers. The teacher mediates, accompanies, and provokes the student to reflect on the issue.

The postgraduates highlighted in the videos the transposition of online elements to real life, the association of complex calculations dynamically and interactively, as well as the practical use of simulations, and the mechanisms created for problem-solving.

- Use of internet resources for interaction between groups - the students in the Bridging our future video (INTEL, 2017) communicate with each other and the teacher to solve the proposed problem, which is the bridge construction. Students chatting in class via WhatsApp may interact about the class topic without the inhibitions they would have when doing it verbally.

- Pedagogical use of social networks - to interact and propose videos, texts, and curiosities on subjects related to the content and, in the end, hold a debate in which everyone can have access to their colleagues' considerations since it is often not possible to use specific material (video, text) in a face-to-face class due to a lack of resources compatible with the physical space.

- Learning through challenges and games-the videos show games and classes scripted with the language of games, which are increasingly present in teaching practices. For generations who are used to playing games, the language of challenges, rewards, competition, and cooperation is attractive, and it is easy to see the use of strategies with well-defined stages and skills that have become more present in the various areas

of knowledge and levels of education. In the videos, teachers suggest that some digital games can be as rich as many books because they require attention, reasoning, and peripheral vision.

- Use of mobile technologies in education - in mobile education, the possibilities that different applications offer to enable knowledge should be known and used in higher education to make the class more dynamic and attractive and contribute to awakening creativity and autonomy.

In the video Bridging our future (INTEL, 2017), students are all focused on their activities individually on their laptops, and the teacher follows up through software that analyzes the interaction or the level of correct answers, verifying that a student has 0%, while the others are actively participating in the class. In the same way, the teacher follows up and identifies the student who won the quiz, which enables him to go to the student to get reports on his experience and thus pass on information about the next steps of the activity. This shows that, although ICT can help, there must be a way to follow up on what is being done from the cell phone or the technological resources used to accomplish the teacher's role in supervising the students since the disorganized use of ICT can generate their dispersion, which is not appropriate to the educational process.

- Dynamic online experiments - with animations and simulations, virtual modeling and materialization of models via 3D printer for testing and experimenting, and the use of digital resources for collaborative editing to adjust the content of online experiments in problem-solving. Enabling the active participation of students in manipulating content, animations, videos, and games in interactive and challenging interfaces allows them to have a critical, evaluative, and conclusive action seeking to elaborate their own concepts from the interactivity with the class content. In this context, it is up to the teacher to indicate the sources of information and organize the path to the content so that the student finds situations in which he can interact, counter-argue, unbalance, assimilate, rebalance and build, he can perform experiments, investigating relationships between the elements studied, thus making his knowledge.

The videos show the possibility of simulation, bringing virtual reality to work, and solving problems before going to the actual situation, especially when the real case brings the risk of injury or death to the person or other individuals. The video Bridging our future (INTEL, 2017) shows a form of collective construction that resignifies the learning and creation process. Although decisions are made on the 'screen,'in the end,the work is realized with the construction of the actual bridge. It can be an enriching way to work, stimulating collaborative skills via the Internet.

Anyone with access to ICT can search for information in a matter of seconds, regardless of geographic location. In the educational scenario, access to information mediated by ICT allows us to broaden the debate about specific themes, build prototypes, perform simulations, and learn a new language, among many other possibilities. In this context, the teacher can experiment with new pedagogical practices or adapt traditional teaching strategies; for example, recommend that the student watch a video on the Internet and comment on the relevant points in the discussion forum with other classmates or participate in a project collaboratively.

In the field of hybrid teaching, the methodology of rotation by learning stations, used by the teacher in the Bridging our future video (INTEL, 2017), streamlines and brings practical aspects to the classroom in order to stimulate the student the dialogue between theory and practice, which are often dissociated, also aiming at training that prepares for life, through the experience of the new in a pragmatic way, in the constant search for autonomy while working collaboratively.

In the third moment of the 'whatsaula,' in the proposed debate, the professor provoked the postgraduates, as university teachers, facing the context of learning with multitasking students, to think of strategies that can be used to 'disconnect' the students from the ICTs and social networks, connecting them to the classes. This interaction occurred on the third day in the morning, and the responses emphasized: the need for student awareness of the excellent use of ICT in the classroom; planning, by the teacher, with the proposal of using ICT attractively and interactively in the teaching-learning process; creation of a blog or forum in social networks for student participation; exploration of the potential of ICT in the classroom in a problematizing way; application of strategies that collaborate with the multitasking context of the student to connect him to classes and disconnect him from tasks that do not contemplate his learning; work with ethical principles of use of ICT and HEI; interaction with students, integrating ICT in their planning, through games that interact with the content or creation of blogs for dissemination of class activities.

In addition, develop pedagogical strategies using the most varied digital resources, creating learning situations in which students become participative, critical, and reflective so that mutual learning can take

place in this process. There are digital applications available on mobile devices, besides social networks, that occupy the subjects' idle time, which leads teachers to develop more motivating teaching strategies, and the DTIC and its devices are partners in this mission.

Teachers, to overcome the difficulties with the use of the DTIC, need to research and participate in training, to better understand the potential of the DTIC; to have the humility to accept the changes as part of the growth in the area, and even if the student knows a specific application better, the pedagogical look of the teacher makes the difference in the context of exchanges and studies, allowing a new look from the student to the known. For this, it is essential to encourage online research as a complement and basis for debates, preparing presentations on Prezzi, and creating videos/channels on YouTube to promote active participation in the classroom.

In the fourth and last moment of the 'whatsaula,' in the debate proposed for the last day of the activity, work was done on the transposition of the elements and the experiences described and discussed in the group to the proposals of the course/discipline plans prepared by the post-graduates, based on the questioning of how to work the perspectives shown in the videos and the group's debates in the higher education classes proposed by them, built in the first classes of the discipline.

The activity encouraged the post-graduate students to take a critical look at what is being discussed in the group about the proposed subject. For this, they should use strategies that could systematize their search, such as searching for texts, images, graphics, activities, slides, books, community pages, discussion groups, blogs, libraries, websites, publications in the area, etc. In addition to conducting the research, the post-graduates were able to produce their potentially useful materials involving the learning of the concepts.

Preferably, they should elaborate conceptual maps and infographics that recapture the meaning of the subject. This type of proposal can positively impact the learning context since such resources help to integrate students' prior and already established knowledge.

Table 1 presents proposals of how each postgraduate can work the ICTs shown in the videos and the group discussion in the higher education classes foreseen in the elaborated plan.

Table 1. ICT in the disciplines proposed by the postgraduates.

Discipline	Proposal for the use of ICT
Criminal law 1	WhatsApp –the creation of a group for further debates on the themes of the class and clarification of any doubts on the subject or the assessment - the group will have access without format restriction to the materials that may be shared: texts, images, audio and videos, provided they are relevant to the subject. Instagram - Sharing images with legal tips on the subject studied in class as a review for the assessment.
Anatomy	Role Playing (RPG) - the student assumes a role in the simulation and has to achieve the objectives of that character in the proposed scenario in a natural way. Papercraft technique - assembling anatomical structures molds in 3D, printed on paper, in which, besides working in groups, the students read and compare with images of the actual structure.
Human Rights	Seminar by YouTube, examining videos from each group with comments on the posts. They are more comfortable studying and organizing the content than in face-to-face workshops.
Didactics	We are readingthe text culminating in a concept map, with one chapter per class, planning with students using the suggestions on the blog of our subject left by the teacher. In this planning, the students must insert the use of ICT, the experience of the most voted plans respecting some pre-established criteria, record with photos, and post the data in the discipline's blog.
History of Sciences	Create a blog for the subject and divide the class into teams. Each group will search the internet for a video/documentary focusing on the history of science and chemistry, as well as videos with the contributions of leading chemists to the construction of chemistry and the scientific advances of humanity. After the research, the groups should post the video according to the schedule, and then all the students in the class should watch and discuss the most relevant considerations in the VLE itself.
Anatomy	Access to anatomical parts in 3D virtual mode and various applications available to study the anatomical structures and their orientation, in addition to the classes in the physical lab. Quiz on the anatomical structures with the help of the Human Anatomy Quis application. In the muscular part and its functions, groups will be created to put together videos discriminating the active muscles in a specific daily activity. Use Street View and Google Earth as classroom tools, with each student choosing one of the models presented in class. This tool can help identify the patterns of socio-spatial formation studied, allowing students to travel without leaving the classroom.

Discipline	Proposal for the use of ICT
Web journalism	Online debate with professionals from various regions of the country through the hangouts application. Production of journalistic articles and creatingof a collective blog in which multimedia content would be published. Use of new platforms for sharing information.
Internet and Web	Knowledge construction resource with concept maps. The students will form groups that, throughout the course, will build concept maps referring to the classes/contents taught throughout the course. A closed forum will be created for each team in the VLE so that, given the content presented by the professor, the students can contribute by inserting and commenting on the maps referred to the classes. In the course's final style, the students will show the maps via Prezzi. At the end of the presentations, the teacher will make the previously closed forums available to all students in the class, who will contribute with their classmates, suggesting the insertion of new concepts in the maps of the other teams. In the end, there will be a collaborative concept map of the class.
Entrepreneurship	Debates and text production using the wiki will try to rescue the students' ability to read and write, which the documentary shows are decreasing in this new scenario, linking the activity of writing to the use of ICT, trying to involve this new student who feels the need to be constantly connected, using the internet.
Curriculum	Use of video lessons authored by the teacher, individual and group readings, flipped classroom, and analysis of documentaries. Video production activities, blogs, Symbaloo, guided research classes on the internet, text production, thematic seminars, and individual e-portfolios. Interaction activities: the creation of a WhatsApp group, discussion forum, collective construction in wikis and Padlet, glossaries, collaborative banks, digital resources and activities, and online joint learning lab.
Education and ICT	Inverted classes, workshops, online debates, interviews about the use of ICT by teachers, and moments to create conceptual maps, videos (tutorials), comics, texts, QR codes, Prezzi, applications, and educational games.
Plane Geometry	Construction of educational games aimed at studying Geometry in primary education and using Geogebra to solve activities and build new tools.
Planning, Curriculum, and Assessment	Some tools, such as Google Room Class, the blog, and WhatsApp, will be used. Using the active methodology, adopting the PBL, the case study, and the flipped classroom, one of the evaluative activities consists of producing and executing a lesson plan for a teaching segment adopting active methodologies and ICT.
English Language Teaching	Theoretical discussions in online forums and face-to-face seminars. Throughout the component, collaborative work will be done with the use of websites and applications that enable the realization of such activities, analysis of websites, applications, and channels available for language teaching, stimulating the production of materials for English language teaching with the use of the Internet and other digital interfaces.

In these proposals, students can be stimulated with didactic sequences that demand them to research, contextualize reading, and participate in the execution of class moments, which is the core of active methodologies.

Final considerations

Social networks are in evidence, and cell phones, smartphones, and tablets have made these network instruments for both professional and personal purposes. They can be used as pedagogical tools in the teaching environment. The use of cell phones in the classroom is a significant possibility, requiring the teacher to think about the actions, tasks, and cognitive processes involved, with a pedagogical strategy, also considering the integration in the students' lives at home, with out-of-school activities, etc.

Using the Internet and social networks allows for greater integration and transparency of relations among students and with subjects and themes of their interest. Social networks use ways to exchange experiences, evaluations, and content with learning information at all levels of study. They can be used in many ways, such as creating learning communities, sharing information and ideas, generating a didactic relationship, etc.

The 'whatsaula' proposal (Alves et al., 2019) reported here involved creating a subject group for the class, using cell phone technology with the WhatsApp app as a means of interaction and collaboration of content and related style.

The SAI activity using 'whatsaula' was motivating for all participants of the subject Methodology of Higher Education with ICT because of the movement it provided in the group, with observations, comments and debates generated. It was an activity that served as a practical example of how personal communication applications can be used in a pedagogical proposal and developexciting and more motivating debates than

some face-to-face activities. Rodrigues and Teles (2019) highlight these perceptions of postgraduates. They emphasize that WhatsApp is attractive, stimulates collaboration among students, and allows the continuity of the face-to-face classroom, providing a sense of belonging to the group.

According to the comments of the graduate students participating in the group, WhatsApp does not have the function of transmitting information but of integrating it with all the people connected in the same virtual space in the process of cooperation, facilitating the construction of learning and knowledge.

With the teacher playing the role of moderator, bringing the issues to the debate, we realized that one of the aspects that makes the difference in using mobile technologies in the classroom is the proposal based on a SAI. The difficulties were increasing activities, the time needed to read many messages, and giving constant attention to the group.

In the formative activity reported, the teacher first asked the students to watch the videos, then provoked the debate. Then, at different times and on different days, he launched questions about the videos, and it was like this until the fourth question. All the participants got involved in the debates, and it was possible to perceive a didactic narrative worked by the teacher.

The fact that several people, physically separated, can interact is a good point for the use of the 'whatsaula' as a pedagogical proposal, for allowing the exchange of experiences, besides other favorable aspects, such as the practice of textual writing and the improvement of communication skills through digital means.

The 'whatsaula' also provides for reflection on the collaborative and social learning approach made possible by the application, whereby the student learns through interaction with partners, emphasizing the learning process from communicational processes among peers.

The big challenge is to develop pedagogical strategies that lead to the construction of knowledge, thinking about promoting cognitive inclusion beyond digital inclusion.

The potentialities developed by these tools can vary according to the technological resources used, ranging from helping, explaining, illustrating, relating, and contributing to amplifying actions established by teachers, in the advancement of activities, besides content management, exchange of ideas, and amplification of the capacity to understand reality.

It is primordial and necessary that the teacher develops a teaching and learning methodology pedagogically with the use of the DTIC in his classes, demonstrating to his students its use regarding the contents approached in the classroom.

It is up to each teacher to plan their teaching, adapt their content to the technological resources available to them and their students, designing more attractive teaching and learning strategies, with interactive and collaborative classes, besides involving the student and demonstrating the importance of ICT in education.

As a highly positive point of the activity, it was found that the participants already use and will use it even more; theWhatsApp application as a didactic tool in the classroom from the motivating results perceived in its use as a pedagogical proposal.

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