Working with noun phrases through ImaColab as a tool for m-learning

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ABSTRACT

Mobile learning is an approach in higher education that can be incorporated into face-to-face education continuum and online education modalities. This article presents an m-learning practice through ImaColab designed for Sociology and Social Work programmes at UNSE taking Technical English. The objective was to assess the usefulness of ImaColab through students and teachers' perspectives and to reinforce noun phrases. A mixed-methods approach was applied and the data obtained from students' scores was contrasted with surveys and an informal interview with the teacher. In conclusion, ImaColab helped to consolidate noun phrases learning and motivated students to work collaboratively. Thus, results indicate the efficacy of ImaColab as a tool for m-learning.
Keywords: m-learning, noun phrases, ImaColab, cooperative learning

RESUMEN

El aprendizaje móvil es un enfoque en la educación superior que puede incorporarse al continuo de la educación presencial y a las modalidades de educación en línea. Este artículo presenta una práctica de m-learning a través de ImaColab diseñada para los estudiantes de las carreras de Sociología y Trabajo Social de la UNSE en la asignatura de Inglés Técnico. El objetivo fue evaluar la utilidad de ImaColab a través de las perspectivas de los estudiantes y los profesores y reforzar frases nominales. Se aplicó un enfoque de métodos mixtos y los datos se obtuvieron a partir de las puntuaciones de los estudiantes contrastadas con encuestas y una entrevista informal con la profesora. En conclusión, ImaColab contribuyó a consolidar el aprendizaje de las frases nominales y los motivó a trabajar de forma colaborativa. Por lo tanto, los resultados indican la eficacia de ImaColab como herramienta para m-learning.
Palabras clave: m-learning, frases nominales, ImaColab, aprendizaje cooperativo

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Introduction

The significant investment in higher education institutions' technologies should support innovation and promote learning by overcoming traditional models. One way to encourage innovation processes in higher education, connecting technology and pedagogy, is by encouraging collaborative work through mobile learning. At a micro level, in every classroom situation, this involves a change in the role that teachers and students have traditionally adopted. Teachers need to broaden their role as experts to incorporate others such as planner, technologist and facilitator. Students need to abandon their passive and receptive role so common in teacher-centred models and take on a type of work that requires them to take responsibility for collaborating in unstructured tasks with multiple possible responses (Sangrà, 2010 as cited in Abu-Al-Aish & Love, 2013).

This type of work is not an easy task. A great effort is necessary in order to implement these changes effectively in the classroom. Students' confidence with mobile device technologies may affect their acceptance of m-learning. Besides, there is a need to provide training in the essential functions and applications of m-learning technologies.

To connect pedagogy and technology, it is essential to support the generation of an appropriate learning environment where it is possible to cultivate feelings of connection, facilitate the so-called social presence and boost relations that humanise the virtual environment. There is a need to take into account the social aspects of collaborative learning and analyse the technological devices as crucial elements in mobile learning and as a challenge for research in the field (Pérez-Mateo & Guitert, 2012 as cited in Abu-Al-Aish & Love, 2013).

According to Agnes Kukulska-Hulme and John Traxler (2005), mobile learning allows for learner mobility and for their involvement in learning activities free from physical limitations. In other words, it is learning taking place via wireless mobile devices such as smartphones, PDAs, and tablet PCs where these devices can move with the learners to allow learning anytime, anywhere. Similarly, Gary Woodill (2011) refers to m-learning as any person's ability to use mobile technology to access relevant information or to store new information wherever that person might be. It is regarded as a personalised learning that links the learner's context with cloud computing by utilising a mobile device. Traxler (2013) asserts that m-learning enhances, extends and enriches learning since it allows for "contingent mobile learning, situated learning, authentic learning, context-aware learning, personalised learning, learning based on user-generated contexts, game-based learning and assessment" (p.2).

M-learning can provide wireless communication between teachers and students and between students themselves. It can work as additional support to complement and add value to existing learning models (Motiwalla, 2007 as cited in Abu-Al-Aish & Love, 2013). The fast spread of mobile devices and wireless networks within university campuses makes higher education a suitable place to integrate student-centred m-learning. Mobile learning is a successful approach in the present, and it is expected to become one of the most effective ways of delivering higher education materials in the future for various reasons (Abu-Al-Aish & Love, 2013).

The advantages of m-learning are that it utilises ubiquitous devices and promotes learning practice in students' environment (Herrera, Palavecino, Sanz & Carranza, 2017). Mobile devices are more attractive among higher education students; they are cheaper than regular PCs; also, they are excellent and economical tools. Mobile devices have become more affordable, effective, and easy to use. These devices can extend the benefits of other learning systems by offering students opportunities to access course materials and ICT, to learn in a collaborative environment and to obtain formative evaluation and feedback from teachers (Abu-Al-Aish & Love, 2013).

Different types of modalities connect technology and education based on the kind of mediated technology utilised. In m-learning, it is considered an educational modality that derives from the type of technology utilised (mobile devices) and mediated in the teaching-learning process, incorporating face-to-face education continuum modalities and online education (Sanz & Zangara, 2014). Different lines of investigations have been pursued regarding technology and education, and various

technological devices have been developed and used to foster learning in different contexts, especially mobile learning.

M-learning practice has widely been used in Universidad Nacional de Santiago del Estero since 2013 with the technical and knowledge support of Instituto de Investigación en Informática (LIDI) from Universidad Nacional de la Plata (UNLP). Such practice appeals to complex educational contexts and can be applied to varied disciplinary fields and education levels.

The present article presents an m-learning experience designed to practise the identification and use of pre-modified noun phrases content belonging to the subject Technical English in Sociology and Social Work university programmes at UNSE. A pre-modified noun phrase is a phrase that consists of a noun or pronoun (called the head) and any dependent words before or after the head. It is one of the contents students need to learn as part of the Technical English syllabus to read, comprehend and translate English texts.

The m-learning practice described in this article was designed using MADE-mlearn, a framework based on a set of 80 aspects or features that allows for the analysis, design and evaluation of the m-learning experience and proposes four axes of analysis when analysing and designing a new m-learning proposal or in existence. The four aspects are: denomination and purpose; context; development modality and proposal application, and results obtained (Herrera, Palavecino, Sanz & Carranza, 2017).

The m-learning practice was carried out through Imacolab, a responsive Web application that is used to:

- allow students to develop educational practices based on images by utilizing their own mobile devices.
- allow teachers to link the theoretical concepts they teach in class to everyday situations.
- incorporate a ludic component to raise students' motivation level and participation.

It requires the use of mobile devices and allows students to work both individually and in a team. This application was developed in 2016 by the Mobile Computing research group at UNSE with the collaboration of UNLP.

The m-learning practice was based on the identification and use of pre-modified noun phrases with UNSE Sociology and Social Work students and it was part of the investigation the UNSE Mobile Computing research group have been doing about m-learning. The main objective of this practice was to assess the usefulness of Imacolab as a tool of m-learning to reinforce noun phrases according to students and teachers' perspectives. Three specific objectives contributed to achieve the main objective:

- to promote collaborative learning through ImaColab
- to increase students´ motivation through ImaColab
- to reinforce noun phrases learning through ImaColab

Literature review

The UNSE Mobile Computing research team has been studying different ways to implement m-learning at different educational levels or in diverse fields of learning. To this purpose, this research team with the collaboration of UNLP designed an m-learning practice and developed a mobile application for it known as ImaColab, which can be used and adapted to any mobile devices.

Before analyzing the practices in different contexts, educational levels and fields of learning where ImaColab was applied, it is necessary to examine some ot the concepts and ideas that led to these practices. These concepts are associated with collaborative work and its advantages; group composition and group size of such collaborative work, the way motivation can be improved through this kind of work and the types of motivation that might play an essential role in such situations.

For the American Psychologist Jerome Bruner (1986), learning is an active social process, in which students construct new ideas or concepts based on current knowledge. The word *social* implies working collaboratively, that is, with others. Thus, collaborative learning provides many work-related opportunities for teachers and students and many benefits for all. Although its benefits are widely

known today, it is rarely practiced and promoted, especially at university levels. Ted Panitz (1996) has highlighted three main advantages of collaborative working: academic, social and psychological; he has also listed 67 distinct benefits within these main areas, which include building self-esteem, reducing anxiety, encouraging understanding of diversity, fostering relationships and stimulating critical thinking (as cited in Roberts, 2004).

Collaboration is perceived as one of the distinctive characteristics necessary for learning in virtual environments. The major emphasis of the collaborative work perspective is placed on the idea of «built knowledge» (Scardamalia & Bereiter, 1994 as cited in Roberts, 2004). This refers to the interaction and reflection process that allows the group to configure meanings together (Harasim & al., 2000 as cited in Roberts, 2004).

Regarding group composition, several authors point out that heterogeneous grouping seems to lead to a deeper learning as a consequence of the contrast of different points of view and diverse levels of comprehension (Harasim & al., 2000 as cited in Roberts, 2004). Both students with a higher comprehension level as well as those less gifted benefit from collaboration. Students can also share different perspectives and points of view, which also support learning. As for group size, authors seem to agree on five members. A bigger number can limit some members' contributions and less than five students might diminish interaction variety.

Collaborative work and good interaction are not the only factors that may influence learning. Motivation is another important factor that needs consideration. Motivation "concerns the direction and magnitude of human behavior" (Dörnyei, 2001, p. 8). It is concerned with the choice of a particular action or decision, that is to say, why someone decides to do something. Robert Vallerand (1997, as cited in Dörnyei, 2001) distinguishes between two well-known types of motivation: extrinsic and intrinsic. Intrinsic motivation "deals with behavior performed for its own sake in order to experience pleasure and satisfaction such as satisfying one's curiosity" (Vallerand 1997, as cited in Dörnyei, 2001, p. 27). People can be motivated because they value an activity and enjoy doing it. People can be motivated to learn for the pleasure and satisfaction of understanding something new or exploring something unknown. Also someone can be motivated to experience stimulation or feel the sensation of achievement after coping with challenges. On the other hand, extrinsic motivation is related to doing or deciding something as a means to an end, such as obtaining high grades or avoiding punishment. Many scholars point out that individuals can be motivated because they receive a strong extrinsic pressure from others such as teachers or parents, or they may also receive threats. Regulations also act as a source of motivation, since people need to obey so as not to feel guilty or just because they accept these as valuable and useful (Dörnyei, 2001; Salazar Mesia, Gorga & Sanza, 2015).

Extrinsic motivation has traditionally been seen as something that can undermine intrinsic motivation. For example, it has been demonstrated that students can lose their natural intrinsic interest in an activity if they have to do it to meet some extrinsic requirements. Motivation is not a relatively constant state but rather a more dynamic entity that changes over time, the level of effort invested in the pursuit of a particular goal oscillating between regular ups and downs (Dörnyei, 2001).

In relation to this, many studies have focused on gathering motivational data in many ways. While there are different instruments to assess students' motivation level, this article reports on the use of IMI (Intrinsic Motivation Inventory) and defines different aspects to analyze the ImaColab application in varied contexts.

Herrera, Palavecino, Sanz and Carranza (2017) implemented an m-learning practice in the Information Systems Degree Programme at UNSE. The practice was especially designed for the learning of structures of linear information and non-linear information contents of the Information Structures and Algorithms course. The practice was designed and implemented by using MADE-mlearn and its aim was to evaluate whether the student is able to represent everyday situations or objects by means of information structures so as to see students' ability to apply learnt concepts to real situations. The practice implied the sharing of images of daily life situations or objects that could be represented in a programme of information structures taught in the course. The results of the practice were analyzed from a quantitative and qualitative perspective. While the qualifications

obtained by the students were observed quantitatively, the teachers of Information Structures and Algorithms were interviewed and their perspectives were analyzed qualitatively. As regards the students, most of them participated and passed the practice. The teachers thought that students' participation was high and that the use of the application allowed them to share selected situations, their representations and teachers' feedback, which enriches students' learning since they not only learn through their individual examples but also from their partners'.

Marilena Maldonado et al. (2018) designed an ImaColab practice to assess students' ability to work with real life organizations and systems of information by applying the knowledge acquired in the Theory of Systems in Organizations of Systems of Information Programme at UNSE. The task implied taking a picture of a Santiago del Estero or La Banda organization, uploading it and indicating address, the aim of the organization, structure of the organization; they were asked to mention a system of information that the organization utilizes by describing the aim of the systems of information, samples of manipulation of information and how it supports decision making. The practice was carried out during the make-up exam period with the participation of five students. The results obtained showed that intrinsic motivation was positive since the interest/enjoyment category was the most selected one in a survey, while the competence category was selected in the second place. On the other hand, the election and pressure category was the least selected. In conclusion, when the practice was introduced, although there was not much interest in carrying it out at first, it aroused a high level of motivation because it was developed through m-learning and consequently, a mobile technology.

As the practices with ImaColab were satisfactory with students within the scope of informatics, it was considered necessary to carry it out with students from other areas of knowledge. Thus, it was decided to work with students from Social Sciences, particularly from the Sociology and Social Work programmes, and explore the usefulness of ImaColab in technical English.

Method

This study was exploratory and descriptive in nature since it aimed to examine the usefulness of an m-learning practice through ImaColab, an app that is still under investigation, and to characterise its use and effect in the teaching of noun phrases in technical English in terms of collaborative learning and motivation (Hernández Sampieri, 2018).

A mixed-methods approach was used to better understand the ImaColab application's usefulness to support the teaching of noun phrases in technical English. This methodology allows for collecting, analysing and mixing both quantitative and qualitative data. The quantitative data obtained were the students' scores during the ImaColab practice, which was statistically analysed; also, students completed a survey after the practice concluded (See Appendix A). As for the qualitative data, an informal interview with the teacher (who also participated in the practice) was conducted. Her perspective about the ImaColab practice was contrasted to the quantitative data obtained from the students' scores and surveys about students' perspectives regarding the practice so as to triangulate data and draw conclusions (Creswell, 2012).

The ImaColab practice was designed using MADE-mlearn. All the characteristics of this framework were considered, except those within the results axis. This framework was necessary to determine the practice's objective, the context within which it would be carried out, the resources needed, and the requisites to use the ImaColab application.

Steps of the implementation of the m-learning practice using ImaColab

1- Firstly, the teacher explained to the 17 selected students that they would carry out an assessment activity in groups using the ImaColab application as part of their assessment process before the first mid-term exam of technical English.
2- Secondly, the 17 students were assigned to different groups according to the attendance sheet, that is, in alphabetical order. Four groups were formed, 3 groups of 4 students and 1 of 5 students, and they were registered as users of ImaColab.

3- A Whatsapp group was created with the students, the teacher and the research team responsible for the design of ImaColab. The group was created for the students to be assisted and guided in case they had problems or doubts during the practice.

4- It was decided that the English teacher in charge of Technical English instruction would participate in the experience under the role of Coordinator and would score the images and provide feedback to the students. The scoring would be based on the teacher´s interpretation of how properly the images represented the noun phrases selected.

5- The deadline for the experience was set: the period for capturing, describing and publishing the photos would last 24 hours; the period for the teacher´s scoring of the photos would be during the following 24 hours, and the period for the inter-group images punctuation would be during the next 24 hours.

6- The students were informed about the requirements of the practice, deadline, tasks and ImaColab application functioning.

7- Finally, the students embarked on the activity.

During the ImaColab practice, the students' objective was to connect the concepts contained in the noun phrases with real-life situations or real-life objects. For that purpose, a text the students had already worked with was selected so as to choose one common topic for all. Then, students had to choose one noun phrase from that text (see Figure 1) and think about how it could be graphically represented through a picture. Also, they had to justify why the picture represented the noun phrase selected.

> perfectly reasonable behaviour
> all social action
> the social experience for life
> a social worker
> different cultures and societies

Figure 1: some noun phrases selected by the students

The fact that all the students owned mid and high range mobile phones, most of them with android OS, resulted in no compatibility problems whatsoever since the ImaColab application runs on all smartphones, no matter its operating system. Every student used their mobile phones and accessed ImaColab through the web browser. The practice was divided into two phases: 1) intra-group upload and score of images, and 2) inter-group score of best images.

Phase 1: intra-group upload and score of images.

The students in each team had to photograph an actual situation or object that represented the noun phrase they had chosen from the text; that had to be done during a particular fixed time, 24 hours in this practice. Every student had to publish the image in the mobile application along with the noun phrase chosen and a justification or description in Spanish of what it represents (see Figure 2). The justification was obligatory. During that period, students had to score the images of all the members in the same group using a range of 0-10, except their own image. The scoring should be based on the students' interpretation regarding how accurately the images represented the noun phrases selected and not on competitive purposes. Apart from the score, they needed to post a comment about the author's justification of the image, which allowed for cooperative learning (see Figure 3). Once this period concluded, their teacher scored each image with the same range 0-10 and provided feedback (see Figure 4). After that, the best image of all the groups was calculated automatically using the following formula:

$$\sum_{i=1}^{j-1} PuntajeEtapa1_i \Big/ j * NotaCoordinador$$

Where,

j is the quantity of members of the group; *PuntajeEtapa1* is the score assigned by each user to the images of their group during phase 1; and *NotaCoordinador* is the score assigned by the teacher.
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Publicado por Morales,Andrea

Justificación

The socialization process : El proceso de socialización. Vínculo esta foto a la frase nominal porque, se puede ver pequeños grupos y sujetos que están sociabilizando, ademas que están en un lugar significativo en el cual constantemente se dan estos procesos. Estos procesos ademas, desde mi punto vista, se dan como un mecaniso de lucha en busqueda de la igualdad.

Figure 2: capture and justify

No seguro | imacolab.com/ImagColabPhp/index.php?action=calificarImagenes

Publicado por Osimi,Antonella

Comentario
Me parece interesante ya que muestra una lucha colectiva.

Puntaje
10

Figure 3: student's score and comment

No seguro | imacolab.com/ImagColabPhp/index.php?action=calificarImagenes

Publicado por Suarez,Claudia

Comentario
Frase, foto y justificación pertinentes

Puntaje
8

Figure 4: teacher's score and feedback

Phase 2: inter-group score of best images.

A new period was set up for students to access the other groups' best images and score each image except the one in their own group. Again, they used the range 0-10. This time the teacher provided no feedback or score since she had already done it in the first phase. Once this new period ended, the best image of the whole practice was calculated (see Figure 5) using the following formula:

$$\sum_{i=1}^{k-1} PuntajeEtapa2_i \Big/ (k-1) * NotaCoordinador$$

Where,

k is the quantity of users that participated in the practice, *PuntajeEtapa2* is the score assigned to the best image of each group by each user during the second phase, and *NotaCoordinador* is the score already assigned by the teacher during the first phase.

Regarding the group members, the score assigned in the first phase was taken into account since they had already scored the images of their own group. As for the score the teacher assigned to the student in the whole practice, it is directly proportional to the score she assigned to the image in the application ImaColab.

Publicado por Castilla Araujo,Eugenia

Justificación

A children's televisión channel Traduccion: Canal de Televisión para niños. Para vincular la frase con la foto se tuvo en cuenta que un grupo de niños miren televisión, en el cual estén trasmitiendo un canal, creado específicamente para ellos.

Figure 5: best image

Results

The results of the m-learning practice were analyzed from a quantitative and qualitative methodology. As for the quantitative results, the students' scores were considered. These were calculated considering the scores they obtained from both the teacher and their classmates on the activity regarding the use of suitable images to represent noun phrases. Figure 6 presents each student's score ordered by group. All the students did well in the practice. Almost a third of students got high scores (9), and a third got 7, only two students got a low score (4), but none failed. This represents a mean average of 7.52.
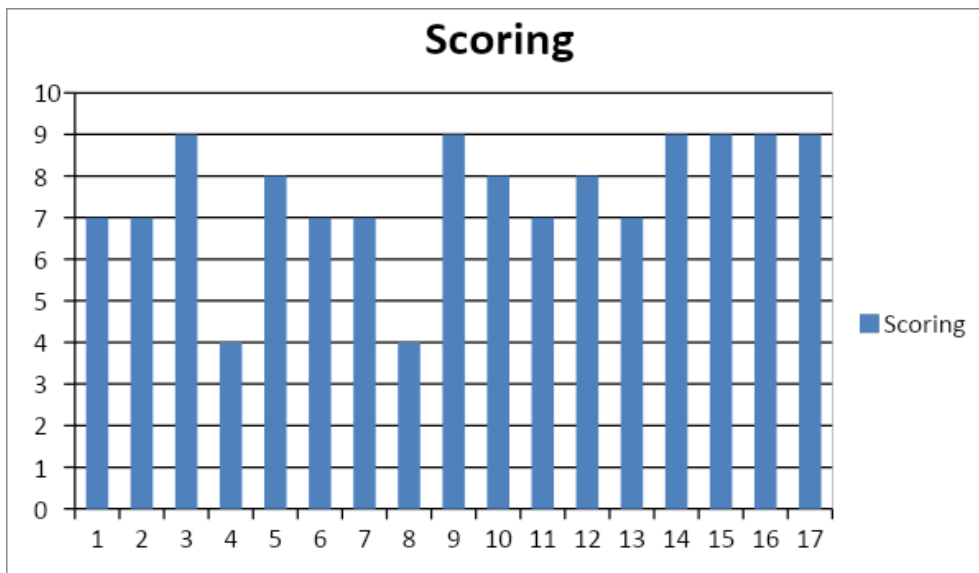
Figure 6: students' scores

After the m-learning practice through ImaColab the students completed a survey about the experience. 12 students out of 17 answered. They were inquired about the efficacy of ImaColab to reinforce noun phrases learning (see figure 7). Most students agreed that it helped them consolidate the learning of noun phrases.
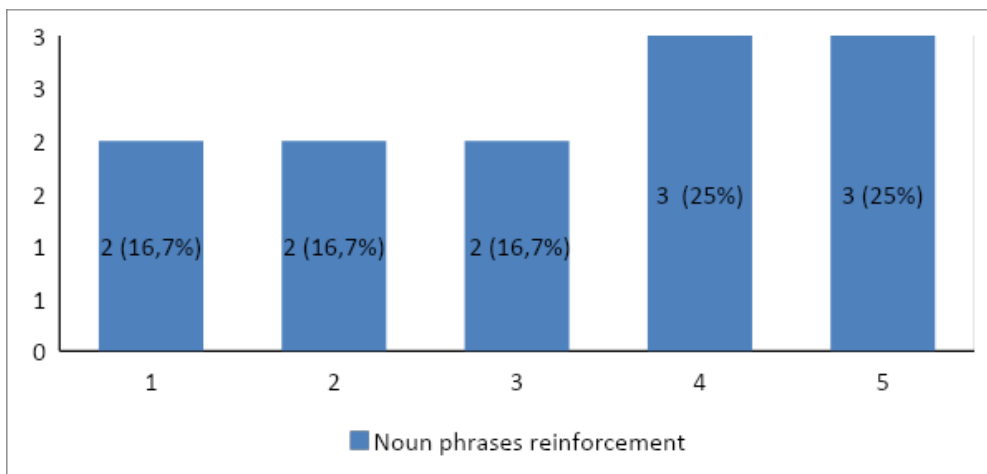

Figure 7: ImaColab contributed to reinforce the learning of noun phrases

They were also inquired about the advantages of using the ImaColab application in terms of enhancing motivation, promoting cooperative work and connecting learning to real-life situations (see figures 8, 9 and 10). Most students expressed that they were motivated to learn and practice the topic proposed through this application implemented by their teacher, which was innovative and quite engaging. Most students also stated they could work collaboratively through the application making positive comments about each other's work and helping each other accomplish the task. In addition to this, almost all the students agreed they were able to connect what they had learnt in class about noun phrases with everyday situations. They could also connect the text's content to situations of their everyday lives and represent noun phrases through a photograph of real situations of their choice.
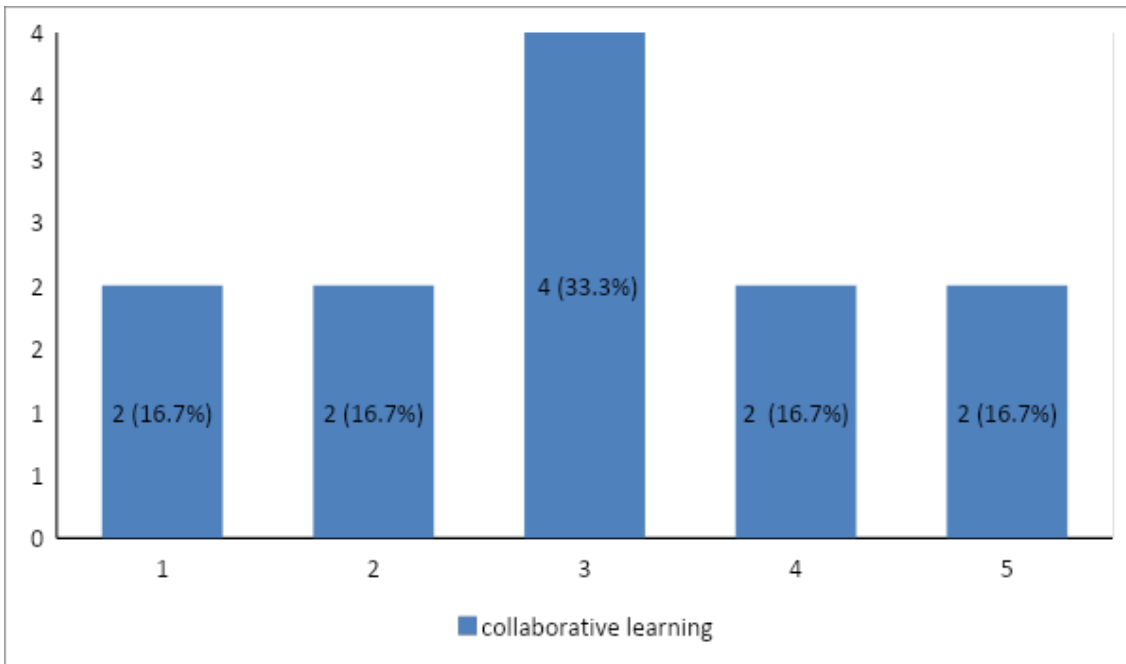
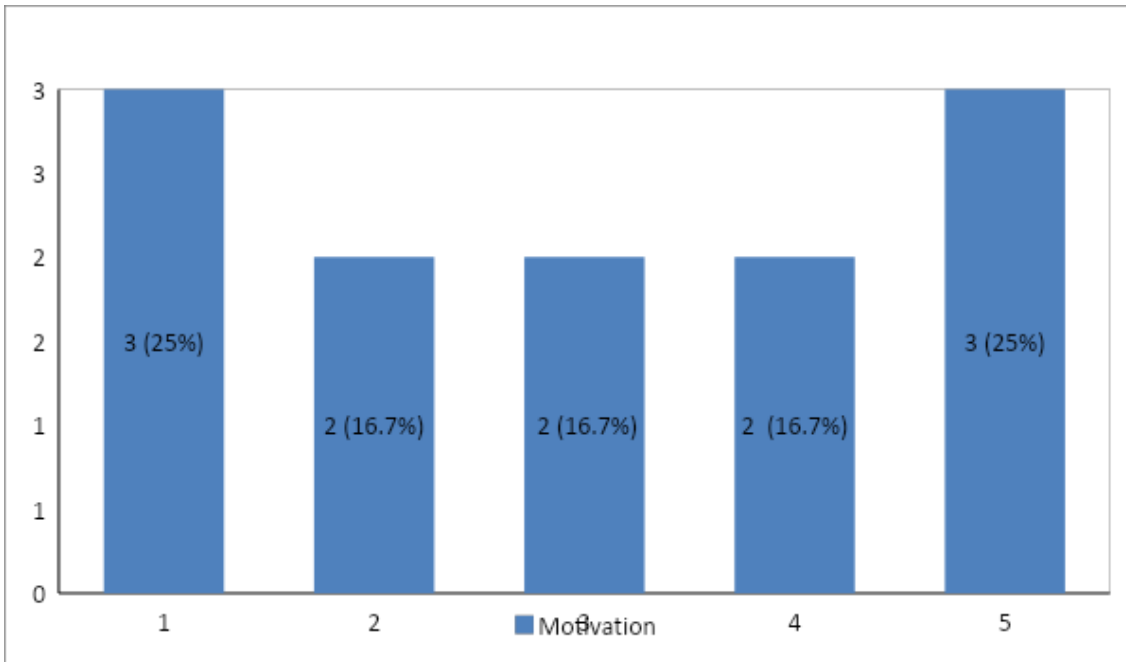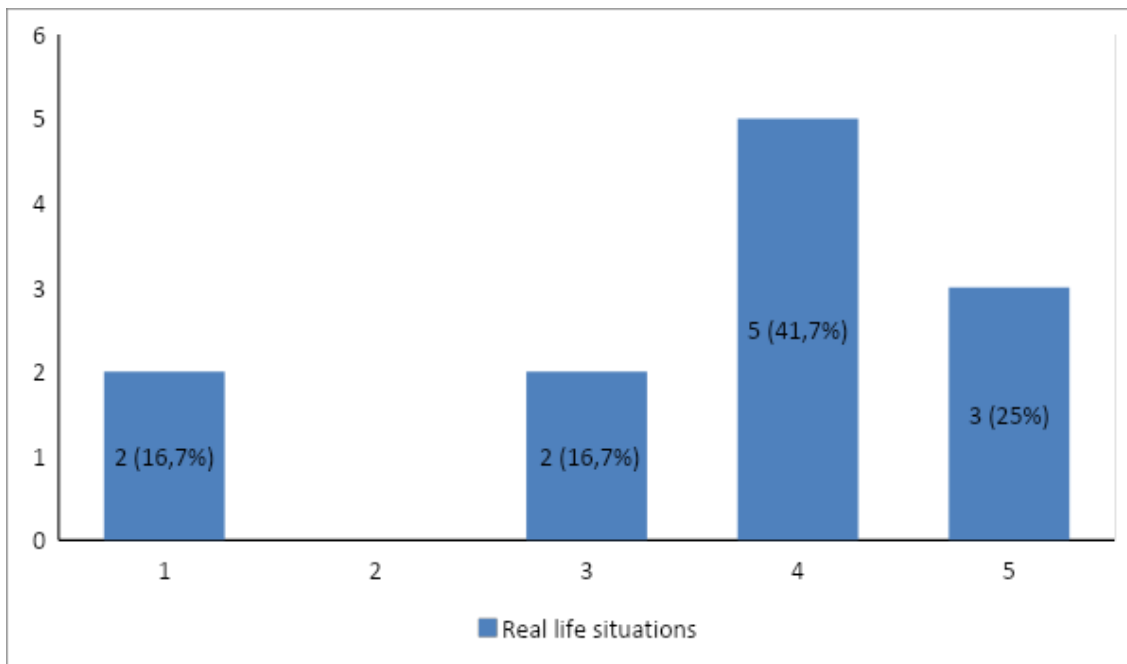**Figure 8:** ImaColab allowed for collaborative learning

Figure 9: ImaColab promoted motivation

Figure 10: ImaColab contributed to link real life situations to their learning

As for the drawbacks identified, some students questioned the specific time assigned to each step in the process; that is, the allotted time to upload the images, justify and punctuate them. They said they would have enjoyed it more if they would have had more time to accomplish it.

Concerning the informal interview with the teacher of this group of students, she stated that the use of ImaColab through mobile phones was motivating since it allowed students to photograph real-life situations connected to what they had already learnt in class, not restricting their options to work; on the contrary, they were free to choose the noun phrase they wanted and represent it by photographing a situation or item they considered relevant. The application also allowed them to share their work with their classmates and make a comment on them, so they learnt collaboratively. She also expressed the advantage of working with the application ImaColab; that is, it is easy to be used and accessible since it can be employed through mobile phones that are devices the students already possess and know how to use. She stated that the students were enthusiastic about working with this innovative tool. Besides, she indicated that all the students' responses were correct (some responses even exceeded her expectations), and none failed. In the end, she said that she would like to apply ImaColab with another group of students from a different university program.

Discussion

The objectives of this study were analyzed in light of the data obtained. This practice's main objective was to assess the usefulness of Imacolab as a tool of m-learning to reinforce noun phrases according to students' and teachers' perspectives. Three were its specific objectives: to promote collaborative learning, to increase students' motivation, and to reinforce noun phrases learning through ImaColab.

The study was valuable because it made it possible to collect the opinions of students who have experienced collaborative work in a virtual environment. It contributed to analyzing the opportunities and challenges offered by the ImaColab application and to foresee where future research can lead in terms of the weaknesses that were detected, and identify those elements that need further exploration.

The usefulness of the ImaColab application as a tool of m-learning was assessed in terms of motivation and cooperative learning of noun phrases. Most students and the teacher indicated the efficacy of ImaColab to motivate participation in the activity, where they had to reinforce the learning of noun phrases by linking them to daily situations of their lives. All the students got good scores with an average mean of 7,52, which demonstrates they succeeded in the task proposed. It also allowed for cooperative learning since they stated that the application was meant to work individually and then make comments about their classmates' work, which encouraged them. The only

disadvantage mentioned was the time allotted for each step in the activity, which should be revised and extended in future practices with ImaColab.

Conclusions / Implications

The ImaColab application is a tool that can be used in any subject at different levels, whether at school or university. It is accessible for participants since they need a mobile phone and internet, which they use every day, and there is no need to spend money. As they have to participate outside the classroom, it incorporates a new kind of learning, m-learning. It is a tool that can promote motivation since it involves the students using their mobile phones, which they are familiar with and feel comfortable with. Also, it allows them to assimilate concepts they have learnt in class and connect them to situations of their daily lives. This is something difficult to achieve, since students do not always connect theory to practice or the concepts learnt in class to real life, whatever courses they are taking. Thus ImaColab can be used as a tool to achieve that purpose.

ImaColab is an excellent option for teachers to work with students who need alternative learning methods in any possible subject areas. This helpful app can create possibilities in difficult situations like the pandemic and safe learning spaces, since students can work at home with daily situations and objects present in their own environment. This can be an enjoyable, motivating and dynamic experience that allows students to work remotely and collectively with their teacher and classmates.

Also, the task required through ImaColab is simple; that is, one photograph and one short justification in which they explain what the photo represents. Simple tasks are quickly understood and carried out. Indeed, ImaColab also fosters collaborative learning, something that teachers are always trying to achieve in their classes. During the task, students interact, they can help each other, and they have to provide feedback (a comment and punctuation). All in all, ImaColab was described as innovative, interesting and satisfactory for most participants in the different practices where it has been implemented so far.

*Participants' names have been included with their permission.

References

Abu-Al-Aish, A.&Love, S. (2013).Factors Influencing Students' Acceptance of M-Learning: An Investigation in Higher Education. *The International Review of Research in Open and Distance Learning,* 14(5), pp. 82-107.

Creswell, J. W. (2012). *Educational Research. Planning, conducting and evaluating quantitative and qualitative research (4th Ed.).* Boston, Pearson Education.

Dörnyei, Z. (2001). *Teaching and Researching Motivation.* England: Pearson Education Limited.

Harasim, L., Hiltz, S., Turoff, M., Teles, L., Sangrá, A., & Duart, J. (2000). *Redes de aprendizaje: guía para la enseñanza y el aprendizaje en red.* Barcelona, EDIUOC Gedisa.

Hernández Sampieri, R. &. (2018). *Metodología de la investigación. Las rutas cuantitativa, cualitativa y mixta.* Mexico, McGraw-Hill Educational.

Herrera, S., Palavecino, R., Sanz, C. & Carranza, J. (2017). Aprendizaje de estructura de datos mediante m-learning. *Simposio Ibero-Americano de Tecnologias Educacionais SITED*, 267-277. Retrieved from https://publicacoes.rexlab.ufsc.br/old/index.php/sited/article/view/95

Kukulska-Hulme, A. & Traxler, J. (2005). *Mobile learning. A handbook for educators and trainers.*London, Routledge.

Maldonado, M., Herrera, S., Carranza, Á., Irurzun, I., Palavecino, R., Macedo, A. & Suarez, C. (2018). M-learning: Aprendizaje en Diversos Niveles Educativos Usando ImaColab. *Revista Codinoa,* 2 (4), pp. 408-417.

Roberts, T. S. (2004). *Online Collaborative learning: Theory and Practice.* USA, Information Science Publishing.

Salazar Mesía, N., Gorga, G. & Sanz, C. (2015). Plan de evaluación del material digital EPRA. Propuesta de indagación sobre la motivación intrínseca. *XXI Congreso Argentino de Ciencias de la Computación CACIC*, pp. 414-423.

Sanz, C. & Zangara, A. (2014). Apuntes del seminario de educación a distancia. Maestría en Tecnologías Informáticas Aplicadas a la Educación. La Plata, UNLP.

Traxler, J. (2013). Mobile learning: starting in the right place, going in the right direction?. *International Journal of Mobile and Blended Learning*, 3(2), pp. 57-67.

Woodill, G. (2011). *The mobile learning edge: Tools and technologies for developing your teams.* New York, Mc Graw Hill Professional.

Appendix
(A)
M-learning enasignaturaInglés

Estimado alumno:
Es importante conocer tu opinión sobre la práctica de m-learning realizada en esta asignatura. La realimentación que se produce impacta directamente en la mejora del curso. Por ello, te solicito dediques unos breves minutos a responder este cuestionario en línea.
¡Muchas gracias!
Prof. Claudia Suárez

1) El uso de dispositivos móviles en el curso me ha permitido incorporar cuestiones de la vida cotidiana al proceso de aprendizaje

Totalmente en desacuerdo   1   2   3   4   5   Totalmente de acuerdo

2) Las actividades de m-learning me han permitido adquirir/mejorar habilidades relacionadas con el uso de los dispositivos móviles *

Totalmente en desacuerdo   1   2   3   4   5   Totalmente de acuerdo

3) El uso de dispositivos móviles ha aumentado mi motivación por aprender *

Totalmente en desacuerdo   1   2   3   4   5   Totalmente de acuerdo

4) El uso de dispositivos móviles me ha permitido aprender en cualquier momento y en cualquier lugar *

Totalmente en desacuerdo   1   2   3   4   5   Totalmente de acuerdo

5) El uso de dispositivos móviles ha beneficiado el aprendizaje colaborativo en el curso *

Totalmente en desacuerdo   1   2   3   4   5   Totalmente de acuerdo

6) La experiencia con Ima-Colab ha permitido afianzar conocimientos sobre frases nominales *

Totalmente en desacuerdo   1   2   3   4   5   Totalmente de acuerdo

7) La experiencia con Ima-Colab ha sido motivadora *

Totalmente en desacuerdo   1   2   3   4   5   Totalmente de acuerdo

8) La experiencia con Ima-Colab nos permitió trabajar en forma colaborativa *

Totalmente en desacuerdo   1   2   3   4   5   Totalmente de acuerdo

9) Repetiría la experiencia educativa basada en Ima-Colab *

Totalmente en desacuerdo   1   2   3   4   5   Totalmente de acuerdo

10) Recomendaría el m-learning a otras asignaturas de la carrera *

Totalmente en desacuerdo   1   2   3   4   5   Totalmente de acuerdo

11) Por favor, utiliza el siguiente espacio para expresar tu opinión acerca del uso de dispositivos móviles como recursos de aprendizaje:

_____
_____
_____
_____