Publicaciones. Facultad de Educación y Humanidades del Campus de Melilla
Depósito legal: GR-94-2001 · eISSN: 2530-9269 · pISSN: 1577-4147
Editor: Facultad de Ciencias de la Educación y del Deporte de Melilla (Universidad de Granada)

Educational Experiences in Secondary Education During the Covid-19 Pandemic: An Analysis from the Perspective of Learning Ecologies

Experiencias de formación en Educación Secundaria durante la pandemia Covid-19: un análisis desde la perspectiva de las ecologías de aprendizaje

新冠疫情期间中学教育的培训经验：从学习生态角度分析

Опыт обучения в средней школе во время пандемии COVID-19: анализ с точки зрения экологии обучения

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Dates · Fechas

Recibido: 2021-02-17
Aceptado: 2021-05-22
Publicado: 2021-07-31

How to Cite this Paper · Cómo citar este trabajo

Blanco, A. (2021). Educational Experiences in Secondary Education During the Covid-19 Pandemic: An Analysis from the Perspective of Learning Ecologies. *Publicaciones, 51*(3), 361–373. https://doi.org/10.30827/publicaciones.v51i3.18473

Abstract

The present world health crisis is having a decisive impact on the educational process of students of all ages, and it has highlighted the need to renew and broaden the context in which they learn. This work aims at providing an answer to these changes by analysing a didactic experience with a group of secondary students using an educational platform called Google Classroom. This application allows the direct connection of students with a number of ICT resources. The study will attempt to explore and reflect on the educational possibilities offered by this new tool from the perspective of learning ecologies. The experience was carried out in the subject of Spanish Language and Literature with 2nd, 3rd and 4th year ESO (Spanish Obligatory Secondary Education) students during the months of lockdown. A good deal of documentary information, together with the students' perceptions, was gathered. The qualitative analysis carried out has allowed the identification of the dynamics implemented within the platform, as well as the implications of the knowledge acquired at an academic, professional and personal level. The results show how the new digital contexts enrich the process of teaching and learning for the participants and, at the same time, contribute to fostering the impact of their education. In short, it is concluded that education needs more pedagogical experiences like these to update the learning processes of the students and, simultaneously, understand how they learn in the digital era in order to guide them more appropriately.

Keywords: learning ecologies; training; Spanish Language and Literature; Secondary Education, ICT.

Resumen

La actual crisis sanitaria mundial está provocando un impacto decisivo en el proceso educativo de los estudiantes de todas las edades y, especialmente, ha constatado la necesidad de renovar y ampliar los contextos en los que estos aprenden. Este trabajo pretende dar respuesta a estos cambios por medio del análisis de una experiencia didáctica con alumnado de Educación Secundaria a través de una plataforma web educativa llamada Google Classroom que permite una interconexión directa con multitud de recursos TIC. En este sentido, se busca conocer y reflexionar sobre las posibilidades formativas que ofrece esta nueva herramienta desde la perspectiva de las ecologías de aprendizaje. La experiencia se llevó a cabo en la materia de Lengua castellana y Literatura y con alumnado de 2º, 3º y 4º de ESO durante los meses de confinamiento. Se recopiló diversa información documental y se recogieron las percepciones de los grupos de trabajo. El análisis cualitativo realizado ha permitido identificar las dinámicas implementadas en la plataforma, así como las implicaciones de los aprendizajes adquiridos a nivel académico, profesional y personal. Los resultados ponen de manifiesto cómo los nuevos contextos digitales enriquecen el proceso de enseñanza-aprendizaje de los participantes y, al mismo tiempo, contribuyen a incrementar el grado de impacto en su desarrollo formativo. En suma, se concluye que la educación precisa de más experiencias pedagógicas de esta naturaleza para actualizar los procesos formativos de los estudiantes y, en simultáneo, comprender cómo estos aprenden en la era digital para orientarles más adecuadamente.

Palabras clave: ecologías de aprendizaje, formación, Lengua castellana y Literatura, Secundaria, TIC.

概要

当前的全球健康危机正在对所有年龄段学生的教育进程产生决定性影响，特别是证实了革新和扩展其学习环境的必要性。本研究旨在通过 Google Classroom 网络教育平台分析关于应对这些变化的中学教学经验。该平台允许与众多 ICT 资源直接互连。我们就此从学习生态的角度来了解和反思这个新工具提供的教学可能性。我们分析了在隔离期间中学二年级、三年级和四年级学生西班牙语和文学科目在线课堂教学经验，收集了各种文献信息及工作组的看法。我们通过定性分析确定平台的实时动态，并且在学术、专业和个人层面分析其学习成果。研究结果表明了新的数字环境如何丰富参与者的教学过程，同时有助于增加对其教育发展过程的影响程度。总而言之，教育需要更多类似经验来更新对学生的教学过程，同时也应该了解他们在数字时代如何学习以可以更充分地指导他们。

关键词: 学习生态, 教学, 西班牙语和文学, 中学, ICT。

Аннотация

Текущий глобальный кризис здравоохранения оказывает решающее влияние на образовательный процесс учащихся всех возрастов и, в особенности, показывает необходимость обновления и расширения контекстов, в которых они учатся. Цель данной работы - ответить на эти изменения путем анализа дидактического опыта работы с учащимися средней школы с помощью образовательной веб-платформы Google Classroom, которая позволяет напрямую взаимодействовать с множеством ИКТ-ресурсов. В этом смысле, цель состоит в том, чтобы узнать и осмыслить образовательные возможности, предлагаемые этим новым инструментом, с точки зрения экологии обучения. Опыт проводился по предмету испанского языка и литературы и со студентами 2-го, 3-го и 4-го курсов средней школы в течение локдауна. Была собрана различная документальная информация и собраны мнения рабочих групп. Проведенный качественный анализ позволил определить динамику, реализованную в платформе, а также последствия полученного обучения на академическом, профессиональном и личном уровне. Результаты показывают, как новые цифровые контексты обогащают процесс преподавания-обучения участников и, в то же время, способствуют повышению степени воздействия на их формирующее развитие. Можно сделать вывод, что образованию необходимо больше педагогического опыта такого рода, чтобы обновить процессы формирования учащихся и, в то же время, понять, как они учатся в цифровую эпоху, чтобы направлять их более адекватно.

Ключевые слова: ИКТ, испанский язык и литература, среднее образование, экология обучения, подготовка.

Introduction: Implications of ICT in the Framework of Learning Ecologies

The advances in technology that have occurred in recent years have brought about important changes and transformations for educational communities, especially regarding the creation of new learning situations (Castells, 2000). These situations can emerge in all kinds of environments and contexts and thus have a decisive impact on how individuals learn and develop in today's society (Dans, 2014). The need to train future generations in digital skills has been echoed in higher education and therefore efforts have been concentrated on designing and planning programs for adequate digital literacy (Area, 2010; Ventimiglia & Pullman, 2016). This reality quickly spread to

all educational levels and especially to teacher training programs focused on responding to these new needs (Tapia, Campaña, & Castillo, 2020). In this context, education through online platforms took on special importance, giving rise to diverse virtual learning environments and demonstrating the pedagogical potential of methodological strategies such as collaborative work (Hernández, 2015). Despite these efforts and the research carried out in this regard, the current global pandemic brought to light the existing digital divide in educational contexts between teachers and students (Ferrada et al., 2021). There is a general tendency to identify young individuals as digital natives (Brown, 2000). However, this assumption is called into question when it comes to education. On the one hand, a high percentage of teachers would be classified as digital immigrants; in other words, people who have been forced by the circumstances of their professional careers to change their usual practices in order to acquire ICT skills. In some cases, they were successful, but on other occasions clear difficulties arose when it was necessary to develop professional practices defined by an intense and consolidated use of technology, either in face-to-face environments or in virtual contexts. On the other hand, when it comes to young people, not everyone has the same degree of skill in the use of ICT, whether for social, economic or cultural reasons (Bennet, Maton, & Kervin, 2008). This further exacerbates the gap in the educational use of ICTs and is clear evidence that the limitations are not explained solely by generational factors.

The recent study by Cabero and Valencia (2021) points out the aforementioned aspects and underlines the importance of taking definitive steps within the educational community with regard to ICT education. The authors insist that there is a lack of greater awareness on the part of the subjects about the impact that technological resources have on learning. In addition, they appeal to the need to reverse attitudes of rejection that still persist. Until more effective measures are taken, it will be impossible to adequately understand the role of new learning scenarios, nor will it be possible to transform the educational processes of teachers and students. More reflective practices are needed to help disseminate and substantiate the effectiveness, efficiency and quality of ICT in education, as well as its benefits for society. Likewise, more care should be taken to ensure the evaluation and quality of the ICT tools that are implemented.

Cobo and Moravec (2011) agree that ICTs have been facilitators of new learning scenarios, but also that they offer an opportunity to relate the knowledge acquired in different situations, contexts and spaces throughout one's lifetime. In this way, mixtures of planned and unplanned learning, structured and unstructured teaching, and the value acquired by both formal and informal learning and self-education have been made possible (Castañeda & Adell, 2013). For all these reasons, it is extremely beneficial to focus on the perspective of learning ecologies in order to be able to further study how new knowledge is managed, organized and planned within the framework of a digital society.

According to the conceptual approaches of Brown (2000), Looi (2001), Barron (2004), Siemens (2007) and González Sanmamed, Sangrà, Souto, and Estévez (2018), ecologies are understood as the set of contexts, situations and environments in which learning takes place, and in which strategies, resources, activities and interactions function as the cornerstone, with a decisive impact on the formation of individuals and their learning throughout life. Additionally, in education they acquire a value and practical sense for teachers and students, as the ecological perspective seeks to make them more aware of what and how they learn during the processes and of how relationships with one's environment and individual interests are also relevant to one's academic, per-

sonal and professional development. If a greater emphasis is placed on this, it will also contribute to making the invisible individual learning and the self-teaching strategies that subjects utilize throughout their ongoing education more visible (Sangrà, Raffaghelli, & Guitert, 2019). In summary, this complex ecological framework is composed of two main dimensions: the intrinsic and the experiential. The first focuses its attention on the individual and on his or her motivations, perceptions and predispositions to learn, while the second draws on all the experiences, resources, relationships and contexts in which the learning process takes place (González Sanmamed, Muñoz, & Santos, 2019). The analysis of experiences from the perspective of ecologies will allow scientific and educational communities to understand how the development of educators and students occurs in the current context and, therefore, to distinguish the elements which enrich the processes that ultimately transform educational models and increase meaningful learning (Santos, 2019).

The virtual environment of Google Classroom provides an ideal space to analyse the implications of ecologies, given its ability to create dynamics and establish communication networks and interactions, as well as to implement new methodological strategies (Silva, 2019). In the last year, it has become the preferred method of distance learning for teachers and students, especially in secondary school contexts. The work of Prado, García, Erazo, & Narvaéz (2020) demonstrates this and also highlights Google Classroom's functions in aiding the teaching-learning process. Among them, the benefits for the development of ICT skills and creativity stand out: the ability to implement methodological approaches that promote collaboration, communication and interaction in networks, design more motivating activities that use other ICT tools, and carry out an individualized follow-up of participants. In the same way, as a platform integrated in Google's G-Suite, Google Classroom facilitates interconnectivity with other services in the form of scheduling sessions and tasks in Google Calendar, storing data in Google Drive, conducting and recording live sessions thanks to Google Meet, and publishing external resources in different formats, among many other forms of integration (Alpañés, 2021).

Consequently, and as shown in the work of Martínez and Benítez (2020), the Google Classroom platform and the experiences it provides facilitate the creation of more active and dynamic learning that places students as the true protagonists, making it possible to analyse the ecologies that are involved in the learning processes and highlighting the opportunities for personal, social and cultural development of young people, whose impact will be decisive in their professional development.

Method

This is a qualitative study that, in accordance with the work of Denzin and Lincoln (2012) and Flick (2015), focuses its attention on a specific educational reality and carefully analyses it in order to gain an in-depth understanding of the phenomena that occur inside that reality, seeking to discover their origins, and highlighting accordingly what changes and opportunities are generated for educational communities. For these reasons, it is of interest to examine educational realities, especially in digital contexts, in which cause and effect relationships are generated among participants.

Thus, the general purpose of this study is to understand and reflect on how secondary students learn and are taught in a virtual environment from the perspective of learning ecologies. The nature of this purpose is laid out in the following specific objectives: (1) to

describe what dynamics were implemented through the digital platform and how they made it possible to enrich the educational process through other ICT tools, (2) to understand the new educational opportunities that arise from the framework of learning ecologies, (3) to give insight into which strategies were involved during the educational process and impacted student learning at an academic, professional and personal level.

The didactic experience was carried out in the 2019-2020 academic year during the months of home confinement from March to June, with students of second, third and fourth grade of Obligatory Secondary Education studying the subject of Spanish Language and Literature. In the second grade, the participants were divided into three groups for a total of 68 students, composed of 31 girls and 37 boys, while in the third grade they were organized into two groups, one with 22 students and the other with 18, with 24 boys and 16 girls. In the fourth grade, there was only one group with a total of 33 students, of which 22 were girls and 11 boys. The total sample was 141 participants whose ages ranged from 13 to 18. In a questionnaire, which was carried out prior to the experience through Google Forms and in which the entire population participated, more than 65% of the students stated that they had not had previous learning experiences in a virtual environment, let alone experiences using a variety of ICT resources. However, 83% confirmed their personal use of social networks. This fact meant that the learning process was developed in different phases in order for the students to undergo an adaptation period in their management of ICT resources and in order to gradually guide the teaching-learning process, thus avoiding any situation of weakness.

For the analysis of the educational phenomenon, a series of qualitative data collection techniques were used, which decisively contributed to facilitating an interpretation of the phenomenon under study. Specifically, data were collected through a discussion group, a questionnaire and documentary analysis. According to Kvale (2011), discussion groups provide different perspectives on a specific topic and produce valuable data as a result of the interactions and reflections of individuals. In this case, the objective was to determine the learning opportunities that the students believed they had experienced through Google Classroom, as well as their strengths and weaknesses in order to develop proposals for improvement. The discussion group was organized through the Google Hangouts tool and was active during the last week of June. In total, eight participants from the three grades were voluntarily involved, of which five were girls and three boys: three from the second grade, two from the third grade, and three from the fourth grade. The question script design was informal in nature and contained a total of ten open and flexible questions that prompted the active participation of all students.

In addition, the individual reflections of all participants have become more relevant. According to McGraw (2014), it is of utmost importance to create spaces for the reflection of the inner self and to grant equal prominence to all voices involved, since the narratives of those investigated always reveal information which is decisive in the holistic interpretation of the object of study. To accomplish this, a questionnaire called "Global Assessment" was designed, with ten questions related to the experience, the students' level of satisfaction, how they learned, and how they improved their digital competence through the educational platform and the integrated tools. The questionnaire's execution was planned for the last week of the course, with a total of 72 hours to complete and submit it as part of a scheduled task in the virtual environment.

Finally, and in line with the work of Rapley (2014), documentary sources were analysed in order to contribute to the analysis of the experience. In total, eight dynamics

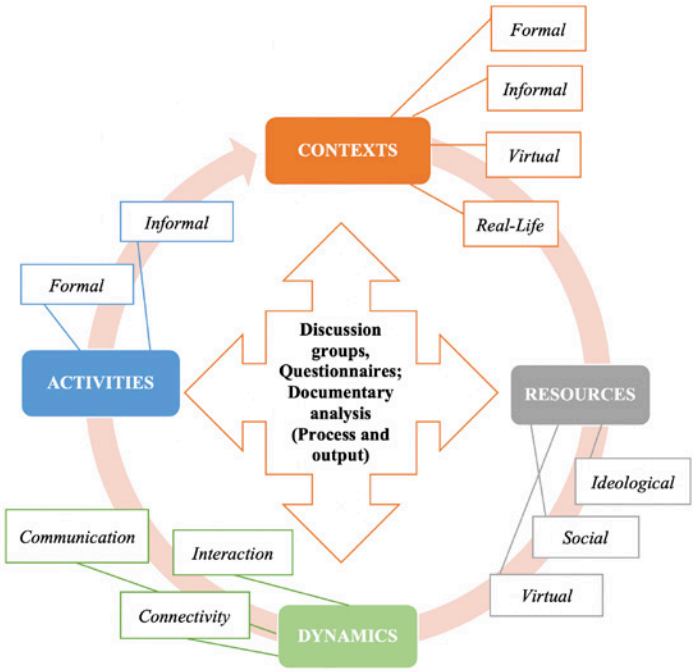
were analysed for each course, as well as the finished products of each scheduled task, whether individually or in small groups. This allowed for the study of the nature of each dynamic and the degree of achievement by the participants. These materials were analysed both during the process and when it came to an end.

Analysis

The data analysis was based on the work of Gibbs (2012), as it was necessary to organize, interpret, analyse and recognize all the components and implications of the learning ecologies. Likewise, and in line with González Sanmamed (1994) and Miles and Huberman (1994), a systematic process of reduction, display, verification and conclusion-drawing of the data was applied. The processes used resulted in the following analysis and coding chart, which is inspired by the works on ecologies (Figure 1) by Barron (2006) and Coll (2013).

Figure 1

Chart of data analysis and coding (Author's version)



Results

The report presented here integrates all the data collected. For proper identification, each of the techniques is represented by a letter of the alphabet: G = discussion group; C = individual assessment questionnaire; P = output and results derived from the planned dynamics. Four dimensions have been identified, the natures of which are set out below.

The first dimension, *Contexts*, reflects data related to the learning environment, both formal and informal, and to the virtual and real-life contexts in which the pedagogical activities were developed. In *Resources*, the elements that have served as mediators at an ideological, social and material level during the learning process are identified. *Dynamics* lays out the opportunities of the experience for connectivity, interaction and communication. Finally, *Activities* highlights the most formal and defining aspects of the experience, as well as those that arose from the interest of the subjects themselves in growing at all levels.

Contexts shows that the platform used led to the acquisition and review of academic content specific to the subject of Spanish Language and Literature. The students identify this as formal knowledge and refer to the four content blocks of the subject (C). In addition, the circumstances provided an opportunity to reinforce and enrich content that was discussed earlier in the course. This content was particularly developed in the virtual space and through presentations, sessions, recordings and planned activities (C). Similarly, the experience was an opportunity for the participants to immerse themselves in a context of activity, in which the interactions with the teacher and with the rest of the students became meaningful and allowed them "to continue learning as if we were in the classroom. " (G). Regarding this context, those moments stand out in which "we had to do some exercises together and be attentive to classmates' answers to correct them, give different answers, etc." (C7). The use of presentations and complementary materials that were shared with the students also sparked individual learning, since "the lessons and the questions that went with them made us think and learn the new content" (C12). The learning process was also carried out, due to the circumstances, from home, and families and cohabitants contributed to the process "mostly to answer quick questions" (G). Likewise, "the textbook and the links to sources to reinforce the content were very useful" (G).

Informal learning was also developed in the same way, through the educational platform. However, here the participants emphasize "the tutorials that we looked up on YouTube to learn how the resource that we were asked to use worked" (C9) and "the phone calls to classmates, the WhatsApp messages to learn how to use it better, the exchanges in groups, etc. " (C21). In some cases, family background was very relevant, as one participant explained: "I had never used so much technology before, and I needed to learn to navigate it" (C27). On the other hand, others' previous experience with video games, social networks and with other educational experiences made it "easier and more intuitive to use some tools, such as CANVA, since it's similar to applications that I use daily to edit photos and make collages" (C30). Participants' immersion in diverse ICT resources allowed formal and informal learning to circulate together, making it difficult to distinguish between the two because "whenever I started working, I was learning something new that [would] surely be useful to me in the future" (G). All this had an impact on students' understanding, since after the experience a majority confirmed that they had acquired a greater awareness of the "value of all experiences, you not only learn from the explanations of the teacher and the book, but also from everything that surrounds us" (G).

Regarding *Resources*, those related to the students' predispositions are recognized first. The subjects state that, during the course of the experience, their motivational levels were highly influenced by the activity and dynamics proposed for each session: "it was a difficult time and the news didn't help, it seemed like there would never be good news, which made it a bit difficult to focus on the tasks in some subjects... that's why we appreciated the more creative ones and the ones that required the use of

mobile phones, social networks, etc." (C29). Time management "was different depending on my mood but it was a huge change to learn to organize work from home" (G) and thus "I think we all learned to plan the day and study in different ways, knowing that we had to be even more responsible since we weren't in the physical classroom" (C33). It is likely that resources of a social nature are "the ones we turned to the most, maybe because of the need to be in contact with our environment and because it's something familiar" (G). The students state that "the situation meant spending more time with those you live with, communicating more and asking them questions that maybe you wouldn't ask before" (G). In the same way, "our classmates continued to be there, and we supported each other when we didn't know how to do something very well. People were always sending voice messages to explain things and that was important for learning" (C41). Regarding material resources, for the students the axis of all action was the educational platform. In their words "it was an easy way to follow the schedule, what had to be done, when it had to be presented and how we should do it" (C69). For them, everything was stored on the platform although they also acknowledge having used the textbook, sources on the net, and websites and social networks to "inspire us, understand, or look for other clearer alternatives" (G). As already mentioned, the students received complete support from their class groups and families, although those resources of a more regulated nature are also recognized as personal resources, such as the help provided "by the teacher aides over the phone to answer questions, by tutors and by the teacher" (C50) thus forming "continuous and immediate monitoring" (G).

Dynamics are born in the context of the activity and three fundamental aspects emerge from them. In the first place, connectivity, due to the fact that the students developed their learning through an educational platform and through "telephone contact, chat messages, etc." (C1). These situations led to greater interaction, especially virtual, which helped them "to understand that it's equally important because it's synonymous with help, support..." (G). All this comes together in an act in which communication is the fundamental piece. In the interactions analysed on the platform and in students' output, one can perceive not only how verbal language acquires greater relevance and care in terms of expression, but also how this occurs in non-verbal language, with the use of "emoticons, images, photos, GIFs and stickers" (C39). In summary, communication was enriched by a whole array of processes that ICT make available to society so that individuals can relate and contribute to the act of communication and its pragmatic reality in the same manner.

The last dimension corresponds to *Activities*. The three groups have the following experiences in common: discussion threads to work on written expression and cross-cutting themes, infographic design for literary content, extended creative writing through the joint composition of poetic, theatrical and narrative texts using the platform; creation of literary subway lines with Metromapmaker, video editing with iMovie or Vivavideo to celebrate Book Day by forming stories with the titles of literary works, musical poems dedicated to COVID-19, creation of micro-stories with Instagram, theatre through TikTok, role-playing games imitating the covers of books and works of art, meme design with Meme Producer or Meme Generator, and the evaluation questionnaire through Google Forms. The analysis of the participants' output is evidence of their development and at the same time of the acquisition of abilities related to emotions and creativity (P). In addition, they show careful language use and a special interest in originality. This feedback was achieved "when our work was shared on the publication wall so that we could learn from each other" (G). All the activities served a pedagogical and formative purpose in addition to meeting the requirements of the official cur-

riculum of the subject and the educational level. Most importantly, they were "really valuable and showed that we could continue to work along the same lines outside of the classroom" (G). Among the tasks that the students undertook to continue learning both individually and self-directed as well as in groups, were: Internet searches, viewing tutorials, application of consolidated ICT strategies to manipulate new resources, exploration of common networks from a didactic point of view, communication in groups for answering questions and brainstorming, and research on social media and web pages as sources of inspiration (C, G, P).

Discussion and Conclusions

Recent works by Allen, Rowan, and Singh (2020) and Cabero (2020) highlight the need to update educational initiatives so that they take full advantage of the possibilities of ICT and accordingly can build new spaces that ensure the quality of teaching. Moreover, this would lead to the acquisition of greater societal awareness of other teaching modalities that go beyond the physical classroom, as has been observed in the experience analysed. The authors also insist that to achieve the above purposes it is vital to provide digital competence education for both teachers and students. The aforementioned results of this study are evidence of the need to build new spaces in which the educational process responds to current demands and in which various strategies for life and problem solving are acquired. What is certain is that this must be accompanied by the necessary technological material in order to avoid situations of inequality and a digital divide. Consequently, what must take place is a dizzying, rapidly-spreading effort which is controlled and guided through processes of evaluation and improvement that highlight the difficulties and demands of individuals.

These educational models must be planned and designed taking into account how subjects learn in the information age. For this reason, and according to Estévez (2020), it is urgent to observe and analyse educational processes through the lens of learning ecologies in order to understand their plurality and complexity. For his part, Souto (2020) advises that educational models must be motivating and feed into the predisposition of the recipients through active and exploratory activities that enrich formal and informal learning.

This experience analysed from the perspective of ecologies has shown what the implications of student learning really are and, moreover, the importance of building knowledge networks so that students can continue to develop while involving their families in the educational process. The use of Google Classroom has been a determining factor in understanding how the phenomena under study emerged, and in approaching a virtual learning community model in which all resources are decisive in the development of students and, especially, their lifelong education (Al-Maroof & Al-Emran, 2018).

The analysis from a qualitative approach has allowed the construction of a reflective account that, without a doubt, has an impact not only on the improvement of techno-pedagogical designs by teachers, but also on how teaching and learning models should be approached. The general purpose of the study has been fulfilled by the observation of different actions and behaviours that students exhibit in learning, revealing the potential value of formal and informal learning in the development of the experience, as well as the strategies which they normally employ (inquiry, communication, interaction, etc). The dynamics, activities and tasks identified are truly valu-

able insofar as they facilitate meaningful learning through a virtual model that goes beyond the systemized vision of space for the storage and exchange of materials. In addition, by using an educational platform, it was possible to integrate social networks and other applications to educate young people about their didactic and educational use, applying and enriching skills already acquired by personal use.

For its part, the meticulous examination of the implications of learning ecologies in formal educational processes has revealed aspects to be taken into account for lesson planning, such as attending to students' tastes and interests, their levels of learning, motivation, needs, and prior skills. It is clear that the entire experience had a decisive impact on the curricular learning of the participants, the development of their knowledge and skills at various levels, and on their personal satisfaction. All of this will have a direct impact on their identity in the future, their knowledge of how to be, and their know-how.

In line with Romeu, Guitert, Raffaghelli, and Sangrà (2020), it is necessary to continue investigating the implications of ecologies in face-to-face, virtual and hybrid teaching contexts to promote true transformations in the training of teachers and the education of students and thus ensure quality lifelong education.

Acknowledgements

The results are part of a more extensive and ambitious study entitled Learning Ecologies in the Digital Age: Opportunities for the Training of Secondary Education Teachers (Reference RTI2018-095690-B-I00) subsidized by the Ministry of Science, Innovation and Universities.

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