

Analysis of a forced blended-learning program in social sciences higher education during the COVID-19 post-pandemic

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Abstract

Purpose – The main goal of this investigation is to analyze the implementation of a forced blended-learning program in social sciences higher education in a post-pandemic COVID-19 context. To reach that target, the authors suggest two specific objectives (S.O.): S.O.1 To analyze the motivation, the resources and the learning effectiveness of the program. S.O.2 To establish the differences emerged between the participants.

Design/methodology/approach – The blended-learning program selected was based on the flipped-classroom model (Krasulía, 2017). The implementation consisted of a 20-min flipped classroom to flexibly follow the theoretical contents through self-elaborated videos uploaded on YouTube and adapted to all kinds of devices, two online theoretical hours driven by the teacher on the Zoom application per week with the whole group to augment explanations and solve doubts and two hours of face-to-face interaction to work cooperatively in small groups of 4–5 students per week. During these practical lessons, the students completed exercises, research reports, oral presentations and a gamification quiz developed each week through the Socrative application to keep the students engaged.

Findings – All the participants agree in very positively valuating the small-group seminars and the teacher's role in the process. This is surely caused because of the pandemic fatigue and the restrictions (Mali and Lim, 2021) that were running during the fall semester of year 2020/2021 when in Spain lived the in-between of the second and third wave of SARS-CoV2. So, as educators and investigators, the authors encourage teachers to incorporate face-to-face interaction elements in forced blended-learning programs, to include seminars in small groups to work cooperatively and to provide the students support and a quick resolution of doubts.

Originality/value – This study provides a significant value in support of a number of studies cited in the study. The study highlights the need for a standardised application of active methods in a standardised way.

Keywords Gamification, Flipped-classroom, Social studies, Active learning, Education

Paper type Research paper



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Introduction

The current post-pandemic context allows to researchers on education sciences to reflect on the way how SARS-CoV2 affected to higher education. During the isolation in 2020 (second semester of year 2019/2020), classes, exercises, practices and exams were necessarily online, but what happened during the next year 2020/2021? Mobility restrictions, based on successive waves of COVID-19, and healthcare measures like the use of facemasks or classrooms' limited capacity determined the structure and methodological strategies of topics and subjects in higher education.

In that sense, some Spanish universities, for example, the University of Murcia, decided to assume a hybrid teaching model, half in person and half online. This strategy can be named as a forced blended-learning environment (Olsen *et al.*, 2022).

As Osguthorpe and Graham (2003) indicated, the term blended-learning is relatively new in higher education. The definition of the concept has been discussed by different authors (Driscoll, 2002; Jones, 2006), and the most common position is that "blended-learning environments combine face-to-face instruction with technology-mediated instruction" (Graham, 2006).

In words of authors like Krasulia (2017) or Garrison and Vaughan (2008) among the advantages of blended-learning models, we can cite

- (1) Blended-learning can result, reportedly, more effective than pure online classes (Estrella, 2021).
- (2) "By using a combination of digital instruction and one-on-one face time, students can work on their own with new concepts which frees teachers up to circulate and support individual students who may need individualized attention" (Krasulia, 2017, p. 222).
- (3) The students that participate in a blended-learning environment require and improve their autonomy, self-regulation and independence to succeed (Salinas *et al.*, 2018).
- (4) "By incorporating IT into class projects, communication between lecturers and part-time students has improved, and students were able to better evaluate their understanding of course material via the use of computer-based qualitative and quantitative assessment modules" (Krasulia, 2017, p. 222).

Obviously, the advantages of a blended-learning model are dependent on the quality of the programs, the role of the teacher, the interest of the contents or the accessibility of the students. As Cambil and Romero (2016) commented, it is challenging for teachers to make a positive integration between content knowledge, pedagogical aspects and technological resources (T-PACK model from Mishra and Koelher, 2006). The teachers have to develop, at the same time, digital competencies for the students and for themselves (Gómez-Trigueros and Moreno-Vera, 2018; Cabero and Martínez-Jimeno, 2019).

So, according to Ramos Navas-Parejo *et al.* (2021), it is important to note that the most crucial element to implement this teaching strategy is the teacher making a good selection of media, resources and communication platforms and adapting the assessment of contents to the new environment (Wong *et al.*, 2014; Vaughan, 2014).

Between the limitations and difficulties that could appear in a blended-learning model, Bartolomé *et al.* (2018) indicated that the positive perception of self-learning that the students develop during the process it is not always linked to real content knowledge learning. A low technological capability by some students to go in the resources, media and communication channels could suppose an important limitation to the success of a hybrid program.

And, lastly, in a forced blended-learning teaching strategy, above all in the context of pandemic isolation and post-pandemic COVID-19 restrictions, it is important to highlight that we can find a significant number of students with Internet connection problems

(Oducado, 2020). Although most of the students are used to working online in higher education, during the isolation and restrictions, most of them returned home in rural areas with bad connection to the Internet (Cullinan *et al.*, 2021).

Attending to the advantages and disadvantages that blended-learning could present, it is necessary, for the teacher, to reflect and use a model of hybrid learning that fits positively with the type of students and their contexts. In that sense, Krasulia (2017) presented seven different blended-learning teaching models:

- (1) Face-to-face driver, where the teacher drives the instruction in person and complements the process with online digital tools (texts, videos, presentations, etc.)
- (2) Rotation model, where the students have an independent online study and then a face-to-face classroom time
- (3) Flex, where the conceptual contents are delivered in an online platform (Wiki, Moodle or similar) and teachers are available for face-to-face support
- (4) Labs, the contents and lessons are also delivered via online platforms, but the students have to follow them in a physical location.
- (5) Self-blended, where the students choose to augment their traditional in-person lessons with complementary digital courses
- (6) Online driver, where the students complete an entire course through digital applications and face-to-face meetings are scheduled only if necessary.
- (7) Flipped-classroom model, where the students are expected to follow the lessons online through videos and presentations so that they can do homework and exercises in classrooms to fix the contents and solve doubts (Gómez-Carrasco *et al.*, 2020).

So, blended-learning it is just a methodological strategy based on a new learning environment, half online and half in-person, but the importance of the role of teacher in crucial. For a good result and learning effectiveness, the blended-learning model have to be appropriated for the students' context, the teacher previously must reflect about making a good selection of media, resources and assessment tools and lastly, it is important not to forget that above the digital competencies, the students have to apprehend the conceptual contents targeted during the process.

Method

Objectives

The main goal of this investigation is to analyze the implementation of a forced blended-learning program in social sciences higher education in a post-pandemic COVID-19 context.

To reach that target, we suggest two specific objectives (S.O.):

S.O.1. To analyze the motivation, the resources and the learning effectiveness of the program.

S.O.2. To establish the differences emerged between the participants.

Method, participants, context and implementation of the program

In this investigation, it has been proposed based on the quantitative method (Hidalgo, 2019; Arellano, 2022; Wu, 2022), and the participants in this research were all students of the third year in the Primary Education Degree of the University of Murcia (Spain) during the year 2020/2021 that, in terms of context, was characterized by post-pandemic COVID-19 measures: mobility restrictions between municipalities, capacity limitation inside the classrooms and care obligations like wearing facemasks.

They were divided into four well-balanced groups in terms of similar previous education:

- (1) Group 1, English bilingual, 29 students.
- (2) Group 2, 23 students
- (3) Group 3, 11 students
- (4) Group 4, French bilingual, 27 students

The total number of participants was 116 ($n = 116$), and all of them were following the topic “Methodologies for teaching Social Sciences in Primary Education”. In this case study, 90 participants were women and 26 men, and the average age is between 20 and 21 years, with the minimum being 19 years and the maximum being 50 years (Table 1).

The blended-learning program selected was based on the flipped-classroom model (Krasulia, 2017). The implementation consisted of the following:

- (1) 20-min flipped classroom to flexibly follow the theoretical contents through self-elaborated videos uploaded on YouTube and adapted to all kinds of devices.
- (2) Two online theoretical hours driven by the teacher on the Zoom application per week with the whole group to augment explanations and solve doubts.
- (3) Two hours of face-to-face interaction to work cooperatively in small groups of 4–5 students per week. During these practical lessons, the students completed exercises, research reports, oral presentations and a gamification quiz developed each week through the Socrative application to keep the students engaged (Gómez *et al.* 2019).

Instrument design, validation and analysis process

At the end of the blended-learning program implementation, the participants filled an ad hoc designed questionnaire about the teaching and learning process following similar assessment instruments used in social sciences education research studies like Moreno-Vera *et al.* (2020, 2021).

The anonymous questionnaire consisted of 22 items divided into three different blocks. The participants had to answer under a Likert-based scale (1–5) from very disagree to very agree:

- (1) Block 1. Motivation during the blended-learning program.
- (2) Block 2. Learning procedures and resources’ valuation.
- (3) Block 3. Learning effectiveness of the implemented program.

Regarding the validation and reliability of the instrument, an internal consistency analysis was made through the 22 quantitative items (Table 2).

	Category	Frequency	%
Sex	Men	26	22,414
	Women	90	77,586

Note(s): Self-elaboration

Table 1.
Participants by sex

The Cronbach's alpha was 0.944, so, according to [Oviedo and Campo-Arias \(2005\)](#), this value represents a very solid reliability. Cronbach's alpha values from 0.5 to 0.6 are acceptable, those from 0.6 to 0.9 are positive and those between 0.9 and 1 are very strong. In addition, the split-half Guttman's test was made with a result of 0.901, which indicates a high internal reliability of the items, according to previous social sciences education research studies like [Gestsdóttir et al. \(2018\)](#), [Gómez-Carrasco et al. \(2019, 2020\)](#) or [Moreno-Vera et al. \(2022a\)](#).

To complete the validation of the instrument, a Kaiser–Meyer–Olkin (KMO) test was carried out to determine the acceptance of the factorial analysis. In this case, Cronbach's alpha of 0.919 was very positive according to investigations like [Pérez-Gil, Moscoso and Rodríguez \(2000\)](#) that commented that a positive analysis must be over the alpha value of 0.05.

The analysis procedure of data was carried out through the statistical package IBM SPSS v. 24 in order to establish a statistical descriptive analysis.

Results and discussion

Results related to the S.O.1

In [Table 3](#), we can observe the statistical results in regard to the specific objective 1 “To analyze the motivation, the resources and the learning effectiveness of the program”.

The average results of the Likert scale (from 1 to 5) show that the most positive items are 14, 13, 17 and 15. They are above a 4.5 average, which means that the participants strongly agree with the affirmations linked to the importance of the teacher during the blended-learning program: *online sessions for resolution of doubts, interaction between teacher and students, face-to-face work in small groups for the final report* and, lastly, *short response time by the teacher* ([Table 3](#)).

The statistical data analysis showed that, according to the participants, for an effective blended-learning program, the role of teachers must be active and compromised. Teachers have to pay special attention to elements like online resolution of doubts to keep the students engaged. If not, some students could feel lost when working independently at home abandoning the program. The interaction between teachers and students must be fluid, and it is important for the participants to answer the doubts quickly ([Ramos Navas-Parejo et al., 2021](#)). Finally, it is also important, according to the participants and other investigations like [Moreno-Vera et al. \(2022b\)](#), to have face-to-face sessions that allow the students to work cooperatively in small groups, to prepare the final report of a didactic unit, to solve doubts in person and, also, to make the practical activities suggested by the teacher.

Other items were valued by the participants with an average between 3 and 4, which indicates some doubts about the blended-learning program implementation (neither agree nor disagree). Items 1, 4, 2, 5 and 8 are related to the first and second blocks of the questionnaire: motivation and resources ([Salinas et al., 2018](#)).

The lowest value of the whole analysis is the item 1 “Flipped-classroom videos improve my motivation to try harder in class” (average: 3.3). In this sense, it is remarkable that the flipped-classroom videos were thought by the teachers as a flexible element to follow the theoretical explanation at any time of the day and in any kind of device. Instead of that,

Cronbach's alpha	Guttman's split-half	KMO	N items
0.944	0.901	0.919	22
Note(s): Self-elaboration			

Table 2.
Reliability of the
instrument

Item	N	Min	Max	Aver	Stand. deviation
1. Flipped-classroom videos improve my motivation to try harder in class	116	1,000	5,000	3,328	1,117
2. Blended-learning motivates me as is linked with my future professional development	116	1,000	5,000	3,457	1,016
3. Socratic quizzes improve my motivation	116	1,000	5,000	4,164	0,986
4. The program motivates me because is more useful than in person instruction	116	1,000	5,000	3,397	1,215
5. Blended-learning model selected was positive	116	1,000	5,000	3,871	1,000
6. Cooperative work in small groups was positive	116	1,000	5,000	4,371	0,947
7. Information given by the teacher was enough	116	1,000	5,000	4,353	0,907
8. Resource: flipped-classroom video	116	1,000	5,000	3,991	1,051
9. Resource: ZOOM meetings	116	1,000	5,000	4,104	0,936
10. Resource: exercises in small groups	116	1,000	5,000	4,388	0,766
11. Resource: Socratic gamification quizzes	116	1,000	5,000	4,307	0,988
12. Resource: Digital platform	116	1,000	5,000	4,304	0,906
13. Teacher role: interaction between teacher and students	116	1,000	5,000	4,612	0,789
14. Teacher role: online resolution of doubts	116	1,000	5,000	4,621	0,765
15. Teacher role: short response time	116	1,000	5,000	4,517	0,797
16. Teacher role: clear instruction to follow the program	116	1,000	5,000	4,440	0,837
17. Teacher role: in-person small-group work for the final report	116	1,000	5,000	4,548	0,737
18. I consider that this model helps me to plan and design my own teaching strategies	116	1,000	5,000	4,133	0,928
19. I consider that this model is useful to understand why a change in Social Sciences education is needed	116	1,000	5,000	4,181	0,929
20. I consider that with this model I can learn different active-learning methodologies	116	1,000	5,000	4,216	0,873
21. I consider that with this model I learnt new ITC resources for Social Sciences education	116	1,000	5,000	4,243	0,938
22. This model was enough to learn to plan and design my own didactic units	116	1,000	5,000	4,129	1,009

Note(s): Self-elaboration

Table 3.
Statistical results for
the S.O.1

students during the COVID-19 post-pandemic situation felt more motivated with other resources like Zoom meetings (average: 4.1) where they received the theoretical explanations live by the teacher and they could interact and ask questions, something that other investigations also commented (Serhan, 2020; Tesar, 2020; Gunawan *et al.*, 2021).

This reflection is confirmed by the second lowest valued item “The program motivates me because is more useful than in person instruction” (average: 3.3), which highlights the participants in the study felt more motivated when coming to face-to-face lessons (Moreno-Vera *et al.*, 2022b) or, at least, following the live explanations from home through Zoom meetings (Serhan, 2020). This shows the good opinions of students about the interaction with the teachers in short times though answer of doubts, and working face to face in the classroom.

Results related to the S.O.2

In relation to the specific objective 2 “To establish the differences emerged between the participants”, Table 4 shows the chi-square test to evidence that all the groups presented positive values far from the alpha value 0.05. That means that the answer of all participants

depends on their level of digital competencies, especially those with a high level in groups 1 and 4 and those with a low level in group 2 (Table 4).

Students from the groups 1 and 4 show a better level of digital competencies, which is coherent with their results in the statistical analysis. Groups 1 and 4 valued better items related to motivation under the blended-learning program as well as they thought that the hybrid strategy was useful to learn the contents. And that is visible through the Kruskal–Wallis test for each particular item, as for example item 5 “Blended-learning model selected was positive” (Figure 1).

In this case, the value obtained in the Kruskal–Wallis test was <0.0001 which is significant lower than the alpha value for this research 0.05. That means that there is a dependence relationship between the very positive perception of the blended-learning model and the fact that these two groups showed a higher level of digital competency development.

Another example of the differences between groups of students can be spotted in item 18 “I consider that this model helps me to plan and design my own teaching strategies” (Figure 2).

Again, in this example, we find that students from groups 1 and 4 are the ones that give better values to this item. The Kruskal–Wallis test shows a value of <0.001 , lower than the alpha value of 0.05. Participants of both groups think that the blended-learning strategy followed on this topic was useful to learn how to plan and design their own future teaching plans, which is the main goal of the topic “Methodologies for Social Sciences education”.

The difference between groups 1 and 4 and the rest of the groups (2 and 3) are remarkable in each item of the study except the item 6, as we can observe in Table 5.

Table 5 shows an interesting result as the item 6 “Cooperative work in small groups was positive” is the only one that does not present a significant Kruskal–Wallis result. That means that there are no differences between the four groups attending on the importance that the participants give to the fact that they preferred to work face-to-face in small groups presentially (Bonk *et al.* 2002).

Obviously, the context is crucial to understand this result. The blended-learning program was developed during the fall semester of the year 2020/2021, from September to December. At that time, in Spain, population was suffering the restrictions between the second and third wave of COVID-19. The health restrictions affected the population in terms of mobility restriction between municipalities, social distances, use of facemasks, Capacity limitation in classrooms and limited social interaction in shops, bars and restaurants.

In that context, the participants of the study, most of them between 20 and 21 years old, thought that in-person interaction was important also in the field of higher education.

The consistency of this answer is related to valuation of specific objective 1 where the most valued items were related to the teacher role, the interaction between teacher and students, the resolution of doubts and, finally, the best valued resource of the program were the small groups lessons to work cooperatively.

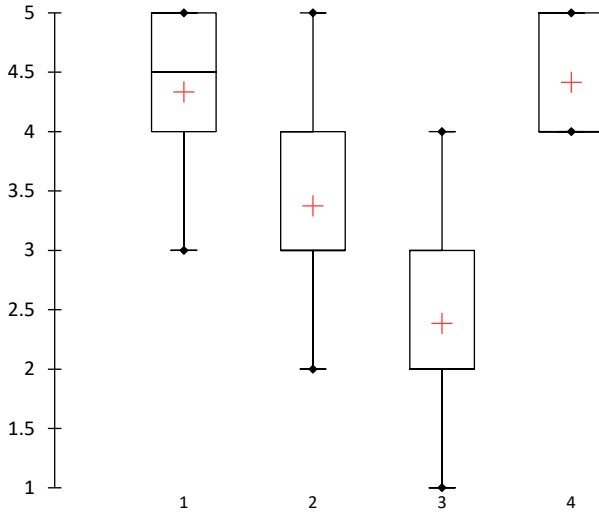
Finally, as we can see in Table 6, there are no significant differences depending on their previous experiences using blended-learning programs. Students of groups 1 and 4 had a previous experience in that kind of hybrid strategy. That is reflected on a better general

Digital competenciesgroup	1	2	3	4	Total
High	0.890	0.203	1,258	0.735	3,087
Low	0.362	1,901	0.112	0.250	2,625
Medium	0.460	0.019	0.475	0.250	1,205
Total	1,712	2,123	1,846	1,235	6,916

Table 4.
Chi-square results for digital competencies

Note(s): Self-elaboration

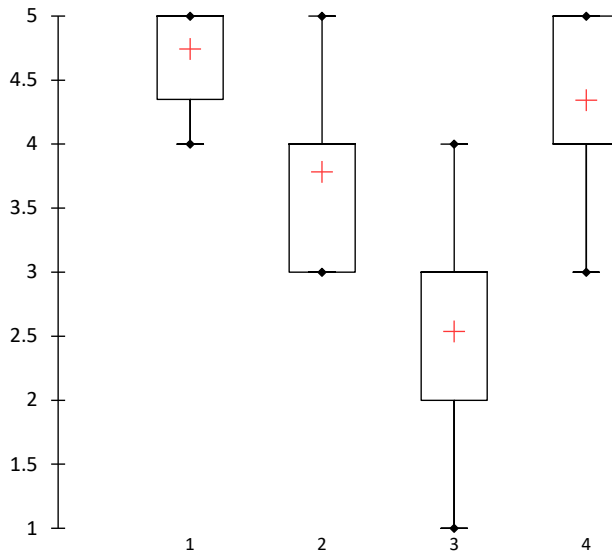
Box plots 5. Blended-learning model selected was positive



Note(s): Self elaboration

Figure 1.
Kruskal-Wallis results
for item 5

Box plots 18. . I consider that this model helps me to plan and design my own teaching strategies



Note(s): Self elaboration

Figure 2.
Kruskal-Wallis result
for item 18

Table 5.
General Kruskal–
Wallis test for all items

Item	Kruskal– Wallis
1. Flipped-classroom videos improve my motivation to try harder in class	<0.0001
2. Blended-learning motivates me as is linked with my future professional development	<0.0001
3. Socrative quizzes improve my motivation	<0.0001
4. The program motivates me because is more useful than in person instruction	<0.0001
5. Blended-learning model selected was positive	<0.0001
6. Cooperative work in small groups was positive	0.000
7. Information given by the teacher was enough	<0.0001
8. Resource: flipped-classroom video	<0.0001
9. Resource: ZOOM meetings	<0.0001
10. Resource: exercises in small groups	<0.0001
11. Resource: Socrative gamification quizzes	<0.0001
12. Resource: Digital platform	<0.0001
13. Teacher role: interaction between teacher and students	<0.0001
14. Teacher role: online resolution of doubts	<0.0001
15. Teacher role: short response time	<0.0001
16. Teacher role: clear instruction to follow the program	<0.0001
17. Teacher role: in-person small-group work for the final report	<0.0001
18. I consider that this model helps me to plan and design my own teaching strategies	<0.0001
19. I consider that this model is useful to understand why a change in social sciences education is needed	<0.0001
20. I consider that with this model I can learn different active-learning methodologies	<0.0001
21. I consider that with this model I learnt new ITC resources for Social Sciences education	<0.0001
22. This model was enough to learn to plan and design my own didactic units	<0.0001

Note(s): Self-elaboration

perception of the blended-learning program, but it does not make a significant difference in terms of answering the questionnaire: their values were around the alpha of 0.05 (Table 6).

So, as we can observe, the main differences between participants are related to groups 1 and 4 that have a better perception of the blended-learning program implemented. These differences are linked to the fact that they are the two bilingual groups (group 1 English and group 4 French), which means that the students go in that groups depending on their high marks and qualifications. At the same time, the students of both groups demonstrate better digital competencies and also are the ones that have previous experience in blended-learning processes.

Conclusions

As we mentioned before, the main goal of this study is to analyze the implementation of a forced blended-learning program in social sciences higher education during the post-COVID-19 restrictions in Spain.

The context, in this case study, is important to understand the results obtained. Although, in general, the program was positively evaluated by the participants in terms of motivation, resources used, the teacher role and learning effectiveness, we can spot some conclusions:

Table 6.
Chi-square result for
differences related to
previous blended-
learning experience

Previous blended-learning experience	1	2	3	4
No	–1,648	0.728	1,646	–0.121
Yes	1,648	–0.728	–1,646	0.121

Note(s): Self-elaboration

Regarding the specific objective number 1 “to analyze the motivation, the resources and the learning effectiveness of the program”, it is important to remark that the items better valued were related to the importance of the role of the teacher. The items 14, 13 and 17 obtained an average response higher than 4.5 in the 1–5 Likert scale. For the participants, the interaction with the instructor was very significant in terms of resolution of doubts (as maybe in a forced blended-learning system they could feel lost) and working presentially in small groups during the seminars at the faculty where they could interact not only with the teacher but as well with other colleagues.

This conclusion is very similar to those of other studies carried out analyzing blended-learning programs during the pandemic of SARS-CoV-2. For example, [Mali and Lim \(2021\)](#) indicated that some students were fed up with the pandemic, the restrictions and the forced online classes. In fact, they found that students prefer face-to-face learning when COVID is not a consideration. In the study of [Mali and Lim \(2021\)](#) they also conclude that the participants consider limiting the blended-learning program, in terms of interaction. For that reason, it is very important for them to interact in-person with teachers and other colleagues.

They valued better face-to-face interaction between colleagues and teachers. The seminars in small groups, developed in person, are the best valued resource. Also the gamification quizzes are very well valued as long as they were implemented presentially. This conclusion is also similar to those of other studies like the one carried out by [Bonk et al. \(2002\)](#) that mentioned that, although students think the use of ICT is important in the learning process, work in small groups and seminars was a key element because it allowed for a meaningful learning, problem-solving with the teacher, interaction among classmates and direct communication.

Other investigations, as [Kenney and Newcombe \(2011\)](#), highlighted that it is so significant in a blended-learning implementation to provide technical and learning support to the students. The instructor has to make sure that the participants feel comfortable with the platform, the tools and the resources. It is important that the teacher do not assume that all the students are adept at how to use technology for learning and, above all, in a forced context like the post-pandemic restrictions.

In general, there was a positive satisfaction on the learning processes, and also their perception was significant about the usefulness of blended-learning program to learn the contents of the subject: how to use ICT resources in Social Sciences Education and how to design learning activities.

Regarding the specific objective number 2 “to establish the differences emerged between the participants”, it is remarkable that the main differences are related to the students in groups 1 and 4 that have a better perception on the hybrid teaching strategy implemented. There are different reasons to explain that differences. First, groups 1 (English) and 4 (French) are the bilingual groups in the Primary Education Degree. The acceptance in these two groups requires higher scores and qualifications. Second, participants of groups 1 and 4 admitted that they already had previous experiences when using blended-learning programs, so when the pandemic arrived, it was not the first time that they used a hybrid learning system. Third, and last, the results showed that the students of groups 1 and 4 had developed better digital competencies which are obviously related to a good use of the blended-learning program as half of the teaching and learning process is carried out online.

Investigations, like the one done by [Tang and Chaw \(2016\)](#), indicated that although having good digital competencies is not a prerequisite for an effective learning in a blended-learning environment, students with high digital competencies find the learning process easier in that kind of programs.

Finally, all the participants agree in very positively valuating the small-group seminars and the teacher’s role in the process. The cause is the pandemic fatigue and the restrictions

(Mali and Lim, 2021) that were running during the fall semester of the year 2020/2021 when in Spain lived the in-between of the second and third wave of SARS-CoV2.

So, as educators and investigators, we encourage teachers to an implementation of blended-learning without coercive, normative and mimetic pressures (Anthony, 2021) but as a method of good practices (Alonso-García *et al.*, 2019) and to incorporate face-to-face interaction elements in forced blended-learning programs, to include seminars in small groups to work cooperatively and to provide the students support and a quick resolution of doubts.

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Further reading

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