



Article

Integrating Flipped Foreign Language Learning through Mobile Devices: Technology Acceptance and Flipped Learning Experience

Alberto Andujar * , María Sagrario Salaberri-Ramiro  and María Soledad Cruz Martínez

Department of English Studies, University of Almería, Crta. De Sacramento s/n, La Cañada de San Urbano, 04120 Almería, Spain; sagrario@ual.es (M.S.S.-R.); mcruz@ual.es (M.S.C.M.)

* Correspondence: alberto.andujar@ual.es

Received: 23 January 2020; Accepted: 3 February 2020; Published: 4 February 2020



Abstract: Blended learning models have been extensively used in foreign language environments to extend in-class time as well as reinforce in-class explanations. Among these models, the increasing popularity of flipped learning has given rise to transformative pedagogies that address many of the problems experienced in traditional lecture-based classes. In this context, the use of stationary devices to develop flipped learning processes has been a common practice over the last years. However, the ubiquitous characteristics of mobile devices have rarely been investigated to carry out these types of learning methodologies. With this aim, the present investigation explores students' perceptions and technological acceptance of the implementation of a flipped learning model in two English as a Foreign Language classes. A quantitative analysis was carried out in order to evaluate the information collected in the two groups. Findings yielded a positive perception of the flipped learning experience, particularly in terms of overall satisfaction. In addition, with regard to the use of mobile devices, participants reported ease of use and highlighted the importance of an appropriate design of the video contents for a successful flipped learning experience through mobile devices. Further research into this topic is sought as students also faced difficulties during the project.

Keywords: flipped learning; blended learning; MALL; CALL; foreign language learning; mobile learning

1. Introduction

The use of Mobile Electronic Devices (MED) in foreign language learning for quality education has been widely investigated over the last years in order to explore the possibilities these devices offered for language instruction. To this end, different researchers and teachers have made use of Bring Your Own Device (BYOD) approaches to language learning in order to further extend and reinforce in-class explanations as well as support students during the learning process. In this context, several researchers in the field of Mobile-Assisted Language Learning claimed that, due to the growing accessibility to mobile devices [1], it is feasible to develop these types of blended learning approaches [2] in which students make use of their own mobile devices for language learning together with face-to-face lecture-based classes.

The role of devices based on wireless connectivity, like smartphones, tablets or Personal Digital Assistants (PDAs), applied to foreign language learning can be split into a number of advantages that include, among others: supporting learning anytime and anywhere, not limiting it to the context of the classroom [3]; favouring human interaction [4] and, more specifically, real and virtual everyday life interaction [5]; or developing language skills and pedagogical approaches [6,7]. In this context, despite the enormous potential of mobile devices for language learning purposes, there seems to be a lack of

curricular integration [8]. Likewise, from a second language perspective, practitioners and educational institutions have been reluctant to incorporate these devices at different educational levels because of different factors such as their distractive nature or the challenges encountered while using them [9]. This situation, which has been a matter of discussion over the last years, can only be tackled through further research into the topic in order to better understand the implementation of mobile learning models and transformative pedagogies. To this end, the present research will further explore students' learning experience and technological acceptance of a blended learning model through mobile devices, specifically, a flipped learning model.

2. Blended Learning and the Use of Mobile Devices

The implementation of blended learning environments, in which in-class time, with a teacher present, is combined with online learning, which is frequently outside the classroom, give rise to educational environments where technology and classroom instruction co-exist [10]. In this context, an appropriate use and understanding of technological tools may lead to the development of successful learning environments that go beyond classroom constraints, such as time and space. At the same time, these transformative pedagogies may become a support in those situations where students are exposed to a high cognitive load [11] such as foreign language classes where students may struggle to understand the language used. Moreover, as pointed out by Carloni [12], technology-enhanced teaching also contributes to the creation of a state-of-the-art learning environment that favours the growth of global workers and citizens.

In this sense, the effects of the implementation of these learning models have been corroborated in previous literature [13,14] and different factors such as higher learner autonomy, an increase in students' participation or a higher motivation have been pointed out. In the same manner, with regard to the language learning field, there is a growing number of studies developing blended learning models [15,16] in second language (L2) classrooms. Normally, these blended learning environments have been developed through the use of stationary devices such as computers which have allowed students to access course content outside the classroom. For instance, blended learning methodologies such as flipped learning, which involves the use of video contents before the class, practice problems as homework and group-based activities [17], are examples of blended learning models.

The concept of a flipped classroom is not new in education as we can find the origin of its implementation in the terms *classroom flip* [18] and *inverted classroom* [19,20], but the extensive development of this teaching technique is due to the spread and innovation on digital devices, technology and broadband internet connectivity [21,22]. It was in 2007 that the flipped classroom became popular in education under the guidance of Bergmann and Sams, based on preparing videos to be watched by the students before face-to-face communication in class. More recently, these authors [23,24] have provided keys for the use of flipped learning to meet sustainable goals in education when they state that this technique facilitates the engagement of all the students in the process of learning in all areas of the curriculum and at all levels. In this sense, the flipped learning model addresses their individual differences and a wide range of abilities including special education needs, personalising learning and considering that the role of the teacher is to help students in the classroom. This seems particularly interesting for those who struggle most, as it brings more inquiry and problem-based learning into the class [25]. Other advantages include: an increase in teacher-student and student-student interaction; a better knowledge of the students; changes in classroom management; open access to resources; a greater autonomy; achievement of objectives at the students' own pace; and the possibility of applying it to any content area [23].

To these ends, blended learning models have also involved the use of mobile devices in foreign language classes to extend classroom instruction. This has been achieved through the use of technological tools such as instant messaging services [25–27], mobile applications [28–30], videoconferencing tools [31,32] or the built-in allowances of mobile devices such as video [33] or photo camera [34]. As observed, the possibilities offered by mobile devices for language learning are varied

and different language skills have been a matter of investigation in Mobile-Assisted Language Learning (MALL).

However, with regard to specific blended learning models such as flipped learning, the amount of research making use of mobile devices is far less. Although the delivery of language contents and input through mobile devices was investigated in early MALL studies [35], flipped foreign language learning has frequently involved the use of stationary devices. In this sense, the ubiquitous characteristics of mobile devices [36] have rarely been considered limiting students' possibilities of learning "on the go". Thus, the present investigation attempts to address this research gap by exploring the technological acceptance and flipped learning experience of foreign language learners using mobile devices.

3. Flipped Foreign Language Learning through Mobile Devices

The number of studies exploring flipped foreign language learning that make use of computer devices has grown exponentially over the last years as reflected in numerous studies published in high-ranking international journals [37,38]. On the other hand, although the number of studies addressing flipped foreign language learning through mobile devices is scarce, several studies have been published in recent years using this learning pedagogy. In this sense, Hsieh, Wu and Marek [35] made use of the mobile instant messaging (MIM) application "Line" to develop a flipped learning methodology with the aim of developing English idioms through written and oral interaction. The study involved a control group receiving traditional language instruction and an experimental group following a flipped learning model. Pre-post test measures and a flipped learning experience questionnaire yielded positive results in favour of those students following the flipped learning model with regard to improving their idiomatic expressions and achieving the instructional goals.

Another example of flipped foreign language instruction through mobile devices is Amirousefy [39] who used another MIM application, in this case "Telegram", to explore the differences between two flipped learning groups and another group which received traditional lecture-based classes. The aim of this study was to observe students' development regarding listening and speaking skills. Pre-post test were used to evaluate language instruction between the groups under investigation and results yielded significant differences in favour of those receiving flipped foreign language classes. Likewise, a flipped learning questionnaire also showed a positive experience among those receiving this type of language instruction. Further examples of the application of this learning methodology through mobile devices is Andujar's [40] investigation into the use of a flipped learning model to deliver foreign language contents through the mobile app "Instagram". This investigation involved a secondary education class to which video content was delivered using the aforementioned social networking platform in order to foster language development. Contrary to previous findings in flipped learning studies, students' engagement in the app did not meet researchers' expectations, although results regarding the flipped learning experience were found to be positive. These results also aligned with other studies such as Garcia Medina's [41] or Yang's [42] studies, in which the experimental groups did not present significant differences over the control in terms of language gains. As in Andujar's [40] investigation, perceptions of the flipped learning model in the two aforementioned studies were positive but no differences in terms of language development were found between the groups. Thus, as pointed out by O'Flaherty and Phillips [43] or González-González et al. [44] in their reviews of the flipped model in higher education, it seems that obtaining stronger evidence in evaluating students' outcomes is necessary.

Thus, in order to further explore students' outcomes in flipped learning models, the present investigation made use of the Technology Acceptance Model (TAM) to further understand students' acceptance and use of technology, as well as a "Flipped Learning Experience Questionnaire" to evaluate students' perceptions [37]. The TAM scale has been extensively used in MALL and Computer-Assisted Language Learning (CALL) to explain students' behaviour and acceptance while using technological tools. In this sense, due to its extensive use, different constructs have been incorporated into the scale [45] to overcome previous limitations such as external variables or low levels of variance in

exploratory studies. Likewise, previous flipped learning research has made use of this scale to address students' acceptance of new technological tools [37,40]. The aforementioned research instruments attempted to answer the following research questions:

Research Question (RQ1): *How did students perceive the use of mobile devices in the flipped model?*

Research Question (RQ2): *How did students perceive learning following the flipped learning model through mobile devices?*

4. Study

The study involved two different groups in which a total 84 participants followed English as Foreign Language classes following a flipped model through their mobile devices. The first group (henceforth Group A) involved 45 Spanish students—26 female and 19 male—and their ages ranged from 14 to 16. On the other hand, the second group (henceforth Group B) consisted of 39 participants—18 males and 21 females—with ages also ranging from 14 to 16. The flipped learning classes took place in two secondary education schools where a series of videos were developed following three B1 didactic units. These units were based on an English coursebook which was set by the English department of the secondary school where the project was carried out. The level of the units as well as the video contents designed and provided to students met the descriptors set by the Common European Framework for Reference (CEFR) for a B1 level. Participants in the project had 3 contact hours per week in which the flipped model was put into practice. Different clips of the classroom contents were given to participants before the class using the platform YouTube where students were subscribed to and followed the teacher's account.

During the in-class time, a communicative approach was followed including task-based learning (TBL) [46] and collaborative work [47]. The teacher of the groups being researched recorded and uploaded oral explanations of the contents to the platform before the start of the lesson. Figure 1 provides examples of the explanations given to participants.



Figure 1. Examples of foreign language explanations in Youtube [48,49].

The Digital Content Production Center of the X University was used to record and edit the videos. Following Mok's [50] recommendations about the duration of the videos, 3 to 5-min videos were created so as to maintain students' engagement. Students accessed the videos through the YouTube app on their mobile phones. A one-hour session was used to instruct students on how to access the videos and when to do it. Students' progress was tracked through the use of the application Edpuzzle that prevented participants from skipping the videos and allowed the teacher to observe who had watched the videos before the lesson. An initial evaluation was carried out at the beginning of each in-class session in order to guarantee students understood the contents. Subsequently, practical sessions in which participants had to put into practice the language explanations in the videos were carried out.

Students' doubts were answered before and during the development of the tasks. Different group tasks related to the contents were created by the teachers of the modules including projects, role-play, discussions and games. Finally, tasks involving reviews of the previously explained contents were carried out.

Practical considerations for the project included different factors such as: guaranteeing all participants had a mobile phone and Internet connectivity; explaining the flipped learning model to participants; and monitoring the effect of the learning model in case any problems occurred.

5. Methodology

A quantitative methodology was used to analyse the data collected in the project. The software SPSS statistics (IBM, Armonk, NY, USA) was utilised for this purpose. Descriptive measures, together with the use of inferential statistics and effect sizes, were used to evaluate the results obtained. This branch of statistics allowed the researchers to make inferences about the groups under investigation. In this sense, the Wilcoxon signed-ranked test [51] was used to analyse the results of the "Flipped Learning Experience Questionnaire". This statistical test allowed the researchers to evaluate if participants leaned more towards either end of the scale as well as the effect size. With regard to the TAM (Appendix A), the data analysis was carried out focusing on the descriptive measures obtained. For this purpose, each of the items in the scale was gathered and coded in order to provide an absolute value for each of the constructs.

5.1. Data Collection Instruments

In order to answer the first research question of this investigation, the "Flipped Learning Experience Questionnaire" [37] addressed 4 different constructs: motivation, effectiveness, engagement and satisfaction. This questionnaire consisted of 14 items based on a 5-point Likert scale going from "Strongly Disagree" (1) to "Strongly Agree" (5). Regarding the validity of the questionnaire, it had been used in previous flipped learning studies and had obtained expert validity. At the same time, it was based on relevant flipped learning literature.

As for the second research instrument, the TAM questionnaire [52] was utilised to explore students' acceptance of the use of mobile devices to carry out a flipped learning approach. This scale has been used extensively in the CALL literature and addresses the following constructs: perceived ease of use, perceived usefulness, attitude towards use, behavioural intention, system characteristics and material characteristics. These last two constructs had also been included in previous flipped learning literature [37,53] in order to further understand students' behavior with technology. Reliability coefficients were calculated in order to guarantee that students had appropriately understood the different items ($\alpha = 0.95$).

5.2. Data Collection Procedure

Regarding the data collection procedure, the two data collection instruments were administered at the end of the project. The teachers implementing the flipped classroom approach were not the researchers for the investigation, which strengthens the reliability of the results obtained. The administration of the two data collection instruments was carried out at the end of the project. A 20-min explanation was provided to participants prior to the administration of the data collection instruments in order to guarantee that the different items were appropriately understood by participants. The data was automatically coded for subsequent statistical analysis. Threats to validity such as socio-economic metadata were considered before the start of the project. To this end, a questionnaire addressing housing conditions, internet connectivity, education, health, and the use of the necessary devices for the project was administered to ensure that these factors did not hinder participation.

6. Results

First, the results gathered in the Flipped Learning Experience questionnaire are presented in Table 1. This questionnaire involved items addressing motivation (1–5), effectiveness (6–9), engagement (10–13) and overall satisfaction (13–14).

Table 1. Descriptive statistics of the Flipped Learning Experience Questionnaire.

Items	N	Mean	SD
1. A flipped classroom is a better way of learning.	84	3.86	1.16
2. I enjoyed the flipped classroom teaching approach more.	84	3.81	1.10
3. I think the flipped classroom is a more effective and efficient way to learn.	84	3.79	1.07
4. I feel more motivated in a flipped classroom.	84	3.69	1.05
5. I participated and engaged myself more in learning in the flipped classroom.	84	3.49	1.12
6. I became a more active learner in the flipped classroom.	84	3.51	1.23
7. I thought the time and effort I spent in the flipped classroom was worthwhile.	84	3.94	1.11
8. I learned more and better in the flipped classroom.	84	3.75	1.11
9. I prefer the flipped classroom to a lecture-based classroom.	84	3.90	1.16
10. I think this model guided me toward a better understanding of the content.	84	3.60	1.08
11. I experienced pleasure in the flipped classroom.	84	3.88	1.11
12. I devoted myself more to the instructional/class activities in the flipped classroom.	84	3.63	1.00
13. I spent more time and effort than usual on my flipped classroom learning activities.	84	3.49	1.16
14. Generally, I am happy and satisfied with this flipped learning experience.	84	4.06	1.11

In this 5-point Likert scale going from “Strongly Disagree” to “Strongly Agree”, 3 indicated the “Neutral” response of participants. As observed in Table 1, the average score for each of the items is over 3 which indicated a positive perception of the participants towards the flipped learning model through mobile devices. However, in order to explore these results in detail, the Wilcoxon rank test was used to measure how students’ mean score for each item differed from the hypothesized median which was set at 3. Likewise, in order to address these differences, the effect size was also calculated.

Amongst the different items in the questionnaire, it is worth mentioning Items 1, 7, 11 and 14 in which high mean scores were found. Item 1 addressed to what extent students agreed with the idea of the flipped classroom as a better way of learning. Results yielded a significant difference from the hypothesised median ($Z = 4.86, p < 0.05$) with a moderate effect size ($r = 0.53$). Likewise, Item 7, which explored whether participants had found the time and effort in the flipped model worthwhile, also presented significant differences from the hypothesised median ($Z = 5.51, p < 0.05$) with a strong effect size ($r = 0.60$). Finally, Item 11 and 14, both related with the degree of satisfaction students’ experienced within the flipped model, also presented significant differences in comparison with the hypothesised median ($Z = 5.30, p < 0.05$; $Z = 6.10, p < 0.05$ respectively) with a moderate effect size for Item 11 ($r = 0.57$) and strong effect size for Item 14 ($r = 0.66$). These findings, together with the rest of the results presented in Table 1, showed that participants had a positive experience of the flipped learning model through mobile devices.

In order to better understand the results of this questionnaire, items were grouped following the 4 different constructs addressed in the scale. Table 2 presents the results of the questionnaire by construct.

Table 2. Descriptive statistics of the questionnaire by construct ($N = 84$).

Construct	Mean	SD	Min	Max	N of Items
Motivation	3.72	0.90	2	5	5
Effectiveness	3.77	0.96	1	5	4
Engagement	3.64	0.91	2	5	4
Overall Satisfaction	4.05	1.11	1	5	1

As observed in Table 2 and answering to RQ1 of this investigation, participants reported adequate levels of motivation, effectiveness and engagement during the flipped learning experience. These results indicated a positive perception of the flipped learning model through mobile devices, particularly in terms of overall satisfaction with the flipped model used during the classes. Nevertheless, there seems to be room for improvement as observed in the standard deviation of each construct which indicated a great variability amongst students' responses.

In order to further explore students' experience in the project, the TAM was used to evaluate students' technological acceptance and behaviour towards the use of mobile devices within the flipped learning experience. Table 3 presents the descriptive statistics of the TAM grouped by construct.

Table 3. Descriptive statistics of the Tehcnology Acceptance Model (TAM).

TAM Constructs	N	Mean	SD	Min	Max	N of Items
System Characteristics	84	3.61	0.93	1	5	4
Material Characteristics	84	3.98	0.82	2	5	5
Perceived Ease of Use	84	3.99	0.83	1	5	4
Perceived Usefulness	84	3.50	0.92	1	5	4
Attitude about Use	84	3.76	0.94	1	5	4
Behavioral Intention	84	3.60	0.93	1	5	4

The results obtained in the TAM scale highlighted an adequate degree of acceptance of the use of mobile devices amongst students in the project. It is worth mentioning the mean scores found for the "Material characteristics" ($M = 3.98$) and "Perceived ease of use" ($M = 3.99$) constructs. Interestingly, students expressed agreement on items related to the quality of the materials and videos provided through their mobile devices, which emphasised the importance of the appropriate production of the video resources and contents. These findings highlighted that not only the technology implemented was of relevance to participants in the flipped learning model, but most importantly, an appropriate design of the language explanations and contents in the videos. Participants also showed agreement, particularly with those items addressing the ease of using mobile devices in the flipped learning process. In this sense, students reported that they did not need much time to understand how to access, use and view the videos provided by the teachers. Students' attitude towards the use of mobile devices to learn English was also found to be positive ($M = 3.76$) and mobile phones were also perceived as an appropriate tool to foster their language skills in the flipped learning model. Finally, although the mean score was slightly lower ($M = 3.60$), similar results were found with regard to students' intention to continue using mobile devices to develop their language skills.

Thus, answering RQ2, the mean scores in the TAM suggest that students' acceptance of and intention to the use of mobile devices in the flipped learning model was positive. However, further research is sought in order to better understand and develop the potential of mobile devices for flipped models in a foreign language class.

7. Discussion and Conclusions

The results of this exploratory study attempted to shed light on the potential for mobile devices to develop blended learning models for language instruction. In this sense, the students' experiences

reported in this investigation aligned with previous flipped learning experiences through mobile devices [37,40] in which participants showed a high degree of acceptance. Students in the project did not perceive any difficulty using their mobile devices for language learning as they already mastered the technology being used. This has also been a common finding in previous mobile-assisted language literature [54–56]. In this context, it seems difficult to explain why most of the flipped learning literature focuses on the use of stationary devices rather than exploiting the ubiquitous characteristics of mobile devices. A possible explanation for the scarcity of such research may be the different restrictions regarding mobile phones in secondary education centres as opposed to higher education institutions where they are more extensively used [57].

Further results, which were pointed out by participants in this investigation, highlighted the importance of elaborating video contents and materials that may contribute to improving the quality of flipped learning processes through mobile devices. Although the aforementioned findings may be also relevant factors for the implementation of flipped learning models through stationary devices, it is worth mentioning how an appropriate design of the video contents may overcome problems normally associated with mobile phone use such as a small screen size, lack of comfort or audio and image quality [58,59]. Likewise, due to the fact that this methodology is relatively new, the role of the teacher becomes essential for the successful development of the flipped learning process. The appropriate implementation of this methodology may also contribute to it achieving higher levels of motivation and engagement, and consequently a better perception of flipped learning models through mobile devices by those students taking part. In this sense, in line with previous research [60,61], the results of this investigation also highlighted a positive effect of the use of mobile devices on satisfaction and engagement. However, further research may address how students' engagement and satisfaction in flipped learning models through mobile devices differ from stationary devices in order to better understand the potential of each technological tool.

As for the use of mobile devices in the flipped model, the inherent characteristics of mobile phones provided opportunities to access the course contents from different locations and at different times. However, in certain cases, Internet connectivity problems due to limited data plans resulted in students experiencing difficulties downloading the videos on their devices. This situation led participants to use Wi-fi areas to watch the videos required for the classes, thus limiting the access to video contents to specific places and, consequently, not fully exploiting the ubiquitous nature of mobile devices. This became a limitation for several participants in the project who struggled to access the video contents from their mobile devices. Further problems experienced by participants involved the distractive nature of mobile devices, which at times, made students lose focus. In line with Levine, Waite and Bowman [62], different mobile applications such as social networks or mobile instant messaging services contributed to this situation. This distractive nature, which was also highlighted in previous mobile-assisted language learning research [5,8], is still an element to be addressed in mobile learning environments. To this end, flipped learning models through mobile devices may need to use platforms or learning management systems (LMS) that prevent students from skipping the video, guaranteeing the viewing of the language explanation.

Finally, this research presents different limitations that may need to be considered for future investigations. First, the small sample used for the study may affect the generalisation of the results obtained. Likewise, the population in this research was exclusively Spanish and mobile phone use may vary depending on the students' backgrounds. Thus, further cross-cultural studies using similar research instruments may guarantee the generalisation of the results and may also provide further insightful information on the development of flipped foreign language learning through mobile devices. However, it is also important to acknowledge that the integration of mobile devices may also generate a digital divide in terms of school safety and regulations, personal finances, or students' social class among other factors. Thus, it seems fundamental to gradually explore and put into practice the possibilities offered by mobile devices and transformative pedagogies, such as the one presented in this investigation, without compromising sustainable education models.

Author Contributions: Conceptualization, A.A.; methodology, A.A.; software, A.A.; validation, A.A.; formal analysis, A.A.; investigation, A.A. and M.S.C.M.; resources, A.A.; data curation, A.A.; writing—original draft preparation, A.A. and M.S.S.-R.; writing—review and editing, A.A. and M.S.S.-R.; visualization, A.A., M.S.S.-R. and M.S.C.M.; supervision, A.A., M.S.S.-R. and M.S.C.M.; project administration, A.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Acknowledgments: We would like to thank the two secondary schools in which the project was carried out as well the professors involved in the development of the project. We would also like to thank the anonymous reviewers for their insightful comments that have greatly contributed to improving the quality of this investigation.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Technology acceptance model (TAM) [37].

	Mark
System characteristics	
1. The use of mobile devices provided activities to learn English in a realistic environment	1 2 3 4 5
2. The use of mobile devices provided a stimulating learning environment	1 2 3 4 5
3. I felt comfortable using a mobile device to visualise the theoretical explanations compared to the face-to-face tuition	1 2 3 4 5
4. I could use my mobile device to improve my learning due to the teacher's explanations	1 2 3 4 5
Material characteristics	1 2 3 4 5
5. The audio/video materials made by the teacher led to a better comprehension of the course contents	1 2 3 4 5
6. The audio/video materials made by the teacher helped me immerse myself in the learning atmosphere of the class	1 2 3 4 5
7. The audio/video materials made by the teacher were useful to learn the class contents	1 2 3 4 5
8. The audio/video materials made by the teacher helped learn the most important aspects of the different units	1 2 3 4 5
9. I believe that the audio/video materials made by the teacher were useful for improving my English level	1 2 3 4 5
Perceived ease of use	1 2 3 4 5
I received a clear guidance about how to use mobile devices and view the videos	1 2 3 4 5
10. Using mobile devices did not require much time	1 2 3 4 5
11. Learning how to use a mobile device for the in-class activities was easy	1 2 3 4 5
The visualisation of the videos through mobile devices was adequate and not stressful	1 2 3 4 5
Perceived usefulness	1 2 3 4 5
12. Learning through mobile devices helped me improve my English skills	1 2 3 4 5
13. Learning through mobile devices enhanced my desire to use the contents learnt	1 2 3 4 5
14. Learning through mobile devices provided a beneficial outcome to this class	1 2 3 4 5
15. The videos made by the teacher were useful to improve my class work	1 2 3 4 5
Attitude about use	1 2 3 4 5
16. I like using mobile devices to learn English	1 2 3 4 5
17. I have a positive attitude towards the use of mobile devices in this class	1 2 3 4 5
18. I believe that using mobile devices to learn English was a good idea	1 2 3 4 5
19. I looked forward to using mobile devices in this class	1 2 3 4 5
Behavioural intention	1 2 3 4 5
20. If I have access to a mobile device, I will explore more videos to improve my English competence	1 2 3 4 5
21. If I have access to a mobile device, I will continue using it to improve my English competence	1 2 3 4 5
22. I will be happy to use the contents I have learnt through my mobile device	1 2 3 4 5
I will have confidence to use the contents I have learnt through my mobile device when I participate in conversations in English	1 2 3 4 5

1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree.

References

1. ITU Facts. Available online: <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2019.pdf> (accessed on 29 January 2020).
2. Burston, J. The future of foreign language instructional technology: Byod Mall. *Eurocall Rev.* **2016**, *24*, 1695–2618. [CrossRef]
3. Han, S.; Kong, W.; Liu, Q.; Zhou, L. Design and Implementation of Mobile English Learning. *Intell. Syst. Des. Eng. Appl.* **2010**, 510–513. [CrossRef]
4. Elaish, M.M.; Shuib, L.; Ghani, N.A.; Yadegaridehkordi, E.; Alaa, M. Mobile learning for English language acquisition: taxonomy, challenges, and recommendations. *IEEE Access* **2017**, *5*, 19033–19047. [CrossRef]
5. Sharples, M.; Taylor, J.; Vavoula, G. A theory of learning for the mobile age. In *Medien. Neuen Kult*; Sage Publications: London, UK, 2010; pp. 87–99.
6. Andujar, A. Benefits of mobile instant messaging to develop ESL writing. *System* **2016**, *62*, 63–76. [CrossRef]
7. Kukulska-Hulme, A.; Viberg, O. Mobile collaborative language learning: State of the art. *Br. J. Educ. Technol.* **2018**, *49*, 207–218. [CrossRef]
8. Burston, J. A survey of MALL curriculum integration: What the published research doesn't tell. *Calico J.* **2014**, *31*, 303–322. [CrossRef]
9. Stockwell, G.; Hubbard, P. *Some Emerging Principles for Mobile-Assisted Language Learning*; The International Research Foundation for English Language Education: Monterey, CA, USA, 2013; pp. 1–15.
10. Im, J.H.; Kim, J. Use of blended learning for effective implementation of English-medium instruction in a non-English higher education context. *Int. Educ. Stud.* **2015**, *8*, 1–15. [CrossRef]
11. Ball, P.; Lindsay, D. Language demands and support for English-medium instruction in tertiary education. Learning from a specific context. In *English-Medium Instruction at Universities: Global Challenges*; Doiz, A., Lasagabster, A., Sierra, J.M., Eds.; Multilingual Matters: Bristol, UK, 2013; pp. 44–66.
12. Carloni, G. Content and Language Integrated Learning: A Blended Model in Higher Education. *Int. J. Technol. Knowl. Soc.* **2013**, *9*, 61–71. [CrossRef]
13. Demirer, V.; Sahin, I. Effect of blended learning environment on transfer of learning: An experimental study. *J. Comput. Assist. Learn.* **2013**, *29*, 518–529. [CrossRef]
14. Law, K.M.; Geng, S.; Li, T. Student enrollment, motivation and learning performance in a blended learning environment: The mediating effects of social, teaching, and cognitive presence. *Comput. Educ.* **2019**, *136*, 1–12. [CrossRef]
15. Alastuey, M.C.B.; Galar, I.A. Flipping the EFL classroom in a secondary education setting: students' perceptions and academic performance. *Huarte De San Juan. Filol. Y Didáctica De La Leng.* **2017**, *17*, 35–57.
16. Nedashkivska, A. Developing a blended-learning model in an L2 classroom. *J. Foreign Lang. Teach. Appl. Linguist.* **2015**, *1*, 1–12. [CrossRef]
17. Bishop, J.L.; Verleger, M.A. The flipped classroom: A survey of the research. In Proceedings of the ASEE National Conference Proceedings, Atlanta, GA, USA, 22 June 2013; pp. 1–18.
18. Baker, J.W. The classroom flip Using Web Course Management Tools to Become the Guide by the Side. 2000. Available online: http://classroomflip.com/files/baker_2000_06_23_classroom_flip_CCCU.pdf (accessed on 12 January 2020).
19. Lage, M.J.; Platt, G. The internet and the inverted classroom. *J. Econ. Educ.* **2000**, *31*, 1. [CrossRef]
20. Lage, M.J.; Platt, G.J.; Treglia, M. Inverting the classroom: A gateway to creating an inclusive learning environment. *J. Econ. Educ.* **2000**, *31*, 30–43. [CrossRef]
21. Sun, J.C.Y.; Wu, Y.T.; Lee, W.I. The effect of the flipped classroom approach to Open Course Ware instruction on students' self-regulation. *Br. J. Educ. Technol.* **2017**, *48*, 713–729. [CrossRef]
22. Zhai, C.; Lafferty, J. A study of smoothing methods for language models applied to ad hoc information retrieval. In Proceedings of the ACM SIGIR Forum, New York, NY, USA, 29 August 2017; pp. 268–276. [CrossRef]
23. Bergmann, J.; Sams, A. *Flip Your Classroom: Reach Every Student in Every Class Every Day*; International society for technology in education: Washington, DC, USA, 2012.
24. Bergmann, J.; Sams, A. Before you flip, consider this. *Phi Delta Kappan* **2012**, *94*, 25. [CrossRef]
25. Andújar-Vaca, A.; Cruz-Martínez, M.S. Mobile instant messaging: WhatsApp and its potential to develop oral skills. *Commun. Media Educ. Res. J.* **2017**, *25*, 43–52. [CrossRef]

26. Andujar, A.; Salaberri-Ramiro, M.S. Exploring chat-based communication in the EFL class: computer and mobile environments. *Comput. Assist. Lang. Learn.* **2019**, 1–28. [[CrossRef](#)]
27. Vázquez Cano, E.; Mengual Andrés, S.; Roig Vila, R. Lexicometric analysis of the specificity of teenagers' digital writing in WhatsApp. *Rla-Rev. De Linguist. Teor. Y Apl.* **2015**, 53, 83–105.
28. Berns, A.; Palomo-Duarte, M.; Dodero, J.M.; Ruiz-Ladrón, J.M.; Calderón Márquez, A. Mobile apps to support and assess foreign language learning. In Proceedings of the Critical CALL–Proceedings of the 2015 EUROCALL Conference, Padova, Italy, 10–15 August 2015; pp. 51–56.
29. Martín-Monje, E.; Arús, J.; Rodríguez-Arancón, P.; Calle-Martínez, C. REALL: Rubric for the evaluation of apps in language learning. Available online: <http://hdl.handle.net/20.500.12020/389> (accessed on 10 January 2019).
30. Vázquez-Cano, E. Mobile Distance learning with Smartphones and Apps in Higher Education. *Educ. Sci. Theory Pract.* **2014**, 14, 1–16. [[CrossRef](#)]
31. Andujar, A.; Medina-López, C. Exploring New Ways of eTandem and Telecollaboration Through the WebRTC Protocol: Students' Engagement and Perceptions. *Int. J. Emerg. Technol. Learn.* **2019**, 14, 200–217. [[CrossRef](#)]
32. Andujar, A.; Rodriguez, J.M.F. WhatsApp and Jitsi to Foster Student Engagement in an American-Spanish Telecollaboration Exchange. In *Recent Tools for Computer-and Mobile-Assisted Foreign Language Learning*; Andujar, A., Ed.; IGI Global: Hershey, PA, USA, 2013; pp. 60–78.
33. Gromik, N.A. Cell phone video recording feature as a language learning tool: A case study. *Comput. Educ.* **2012**, 58, 223–230. [[CrossRef](#)]
34. Liu, P.-L.; Chen, C.J.A. A study of mobile-assisted photo-taking for English phrase learning and sentence making. In *The Medium Matters, Proceedings 15th International CALL Conference*; Colpaert, J., Aerts, A., Wu, W.-C.V., Chao, Y.-C.J., Eds.; Taylor & Francis: Taichung, Taiwan, 2012; pp. 762–765.
35. Ally, M.; Tin, T.; Woodburn, T. Mobile learning: Delivering French using mobile devices. In Proceedings of the 10th World Conference on Mobile and Contextual Learning (mLearn), Beijing, China, 18–21 October 2011; p. 448.
36. Yu, S.; Ally, M.; Tsinakos, A. *Mobile and Ubiquitous Learning: An International Handbook*; Springer: New York, NY, USA, 2017.
37. Chen Hsieh, J.S.; Wu, W.C.V.; Marek, M.W. Using the flipped classroom to enhance EFL learning. *Comput. Assist. Lang. Learn.* **2017**, 30, 1–21. [[CrossRef](#)]
38. Lee, G.; Wallace, A. Flipped learning in the English as a foreign language classroom: Outcomes and perceptions. *Tesol. Q.* **2018**, 52, 62–84. [[CrossRef](#)]
39. Amiryousefi, M. The incorporation of flipped learning into conventional classes to enhance EFL learners' L2 speaking, L2 listening, and engagement. *Innov. Lang. Learn. Teach.* **2019**, 13, 147–161. [[CrossRef](#)]
40. Andujar, A.; Çakmak, F. Foreign Language Learning Through Instagram: A Flipped Learning Approach. In *New Technological Applications for Foreign and Second Language Learning and Teaching*; Kruk, M., Peterson, M., Eds.; IGI Global: Hershey, PA, USA, 2020. [[CrossRef](#)]
41. García Medina, P. *Turn My Learning Upside Down: The Effects of the Flipped Classroom on Adult Learners*; Unpublished Master Project; University of Navarra: Navarra, Spain, 2017; Available online: <https://bit.ly/2LfOpvm> (accessed on 29 January 2020).
42. Yang, C.C.R. An investigation of the use of the 'flipped classroom' pedagogy in secondary English language classrooms. *J. Inf. Technol. Educ. Innov. Pract.* **2017**, 16, 1–20.
43. O'Flaherty, J.; Phillips, C. The use of flipped classrooms in higher education: A scoping review. *Internet High. Educ.* **2015**, 25, 85–95. [[CrossRef](#)]
44. González-González, C.S.; Gómez del Río, N.; Navarro-Adelantado, V. Exploring the Benefits of Using Gamification and Videogames for Physical Exercise: a Review of State of Art. *Int. J. Interact. Multimed. Artif. Intell.* **2018**, 5, 46–52. [[CrossRef](#)]
45. Rafiee, M.; Abbasian-Naghneh, S. E-learning: Development of a model to assess the acceptance and readiness of technology among language learners. *Comput. Assist. Lang. Learn.* **2019**, 1–21. [[CrossRef](#)]
46. Ellis, R. *Task-Based Language Learning and Teaching*; Oxford University Press: Oxford, UK, 2003.
47. Nunan, D.; Swan, M.; David, N. *Collaborative Language Learning and Teaching*; Cambridge University Press: Cambridge, UK, 1992.
48. Flipped video. Available online: <https://www.youtube.com/watch?v=CexyKxSmFRw> (accessed on 29 January 2020).

49. Flipped video. Available online: <https://www.youtube.com/watch?v=dptepEWNv1g> (accessed on 29 January 2020).
50. Mok, H.N. Teaching tip: The flipped classroom. *J. Inf. Syst. Educ.* **2014**, *25*, 7.
51. Wilcoxon, F.; Katti, S.K.; Wilcox, R.A. Critical values and probability levels for the Wilcoxon rank sum test and the Wilcoxon signed rank test. In *Selected Tables in Mathematical Statistics*; Harter, H.L., Owen, D.B., Eds.; American Mathematical Society: Providence, RI, USA, 1970; pp. 171–259.
52. Davis, F.D.; Bagozzi, R.P.; Warshaw, P.R. User acceptance of computer technology: a comparison of two theoretical models. *Manag. Sci.* **1989**, *35*, 982–1003. [[CrossRef](#)]
53. Huang, Y.M.; Huang, Y.M.; Huang, S.H.; Lin, Y.T. A ubiquitous English vocabulary learning system: Evidence of active/passive attitudes vs. usefulness/ease-of-use. *Comput. Educ.* **2011**, *58*, 273–282. [[CrossRef](#)]
54. Andujar, A. Evaluating Mobile Instant Messaging for L2 Development: A Longitudinal Investigation. In *Assessing the Effectiveness of Virtual Technologies in Foreign and Second Language Instruction*; Kruk, M., Ed.; IGI Global: Hershey, PA, USA, 2019; pp. 191–215.
55. Kukulska-Hulme, A.; Shield, L. An overview of mobile assisted language learning: From content delivery to supported collaboration and interaction. *ReCALL* **2008**, *20*, 271–289. [[CrossRef](#)]
56. Webb, M.; Doman, E. Impacts of flipped classrooms on learner attitudes towards technology-enhanced language learning. *Comput. Assist. Lang. Learn.* **2019**, 1–35. [[CrossRef](#)]
57. Sevillano-Garcia, M.L.; Vázquez-Cano, E. The impact of digital mobile devices in higher education. *J. Educ. Technol. Soc.* **2015**, *18*, 106–118.
58. Shudong, W.; Higgins, M. Limitations of mobile phone learning. In Proceedings of the IEEE International Workshop on Wireless and Mobile Technologies in Education (WMTE'05) proceedings, Tokushima, Japan, 28–30 November 2005; p. 3.
59. Hashemi, M.; Azizinezhad, M.; Najafi, V.; Nesari, A.J. What is mobile learning? Challenges and capabilities. *Procedia-Soc. Behav. Sci.* **2011**, *30*, 2477–2481. [[CrossRef](#)]
60. Hao, Y. Exploring undergraduates' perspectives and flipped learning readiness in their flipped classrooms. *Comput. Hum. Behav.* **2016**, *59*, 82–92. [[CrossRef](#)]
61. Yilmaz, R. Exploring the role of e-learning readiness on student satisfaction and motivation in flipped classroom. *Comput. Hum. Behav.* **2017**, *70*, 251–260. [[CrossRef](#)]
62. Levine, L.E.; Waite, B.M.; Bowman, L.L. Mobile media use, multitasking and distractibility. *Int. J. Cyber Behav. Psychol. Learn.* **2012**, *2*, 15–29. [[CrossRef](#)]



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).