The *Journal of*
Teaching English with Technology

Anniversary Issue

20 Years of Teaching English with Technology

The Journal of

Teaching English with Technology

Anniversary Issue   *(TEwT)*

20 Years of
Teaching English with Technology

Publishers

IATEFL Poland Computer Special Interest Group

University of Nicosia

Maria Curie-Skłodowska University

ISSN 1642-1027

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VOLUME 21, ISSUE 1
SPECIAL ANNIVERSARY ISSUE
- 20 YEARS OF TEACHING ENGLISH WITH TECHNOLOGY

20 YEARS OF TEACHING ENGLISH WITH TECHNOLOGY
– AND 20 MORE YEARS AHEAD

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Introduction

Twenty years might not seem to be a long time in foreign language pedagogy, however, if one looks back at the development of methodology, it took some methods a similar amount of time to gain recognition, popularity and maturity resulting in widespread and global usage. Nonetheless, if we think about Computer-Assisted Language Learning that dates back to only the 1960s, and if we think about the widespread use of the Internet in language teaching and learning starting in the late 1990s, the twenty years of publication of *Teaching English with Technology* might actually be a significant portion of the whole history of CALL. In this opening article, we will try to sketch the development of the discipline as indicated in our Journal's submissions, trying to show the present-day research interests and possible paths for future studies.

A look back at the past twenty years

Teaching English with Technology was established at the turn of the 21st century by the humble undersigned (**Jarosław Krajka)** as a newsletter of the International Association of Teachers of English as a Foreign Language (IATEFL Poland) Computer Special Interest Group (currently IATEFL Poland Learning Technologies SIG), Moreover, this venture, which had been greatly inspired and encouraged by **Jozsef Horvath**, was, in many places of the world, the beginning of educational usage of the Internet. Hooking up schools and classrooms (at that time on cable Local Area Networks available in school computer labs) enabled opening a whole new sphere of teaching, called Internet-assisted teaching, Internet-mediated teaching, Internet-assisted language learning or teaching with the Internet. The first years of publication of *Teaching English with Technology* reflected this trend to a great extent – a large number of publications devoted to Internet activity formats in ESP authored by **Maria Jose**

Luzon Marco (Luzon Marco 2001a, 2001b, 2001c, 2002, 2003) and a separate section with Internet lesson plans responded to the interest in transferring language instruction to the Internet medium. While teaching with the Internet has become largely forgotten these days, the continued interest in blended learning and flipped learning (both prominently represented in the Annniversary Issue) shows a need for investigation of the ways of assisting classroom instruction with online activities, which can be evidenced, for instance, in more recent publications of Awada & Burston (2020) or Rivera-Trigueros & Sánchez-Pérez (2020).

Another theme that featured both in the opening issue and the current Anniversary Issue is telecollaboration. In the early days of Internet-assisted language teaching mainly organised through email (Krajka, 2001), text-based chat or voice Skype to ensure active learning (Egbert, 2001), nowadays more and more sophisticated applications are being used for telecollaboration of partner classes. Apparently, while computer environments change with technological progress, well-tested classroom applications, activities and procedures remain valid (see Casañ-Pitarch & Candel-Mora, this issue).

Once Web 2.0 became more prominent at around 2004-2005, a number of studies, software/website reviews and practical articles started to focus on verifying selected Web 2.0 applications empirically for use in language learning and teaching. While many of those ceased operation after the dot-com bubble broke and in the second decade of the 21st century, it was no longer catchy to call applications or methodologies 'Web 2.0', many survived until the present day, either in the same form or remashed and remixed with others after acquisitions and mergers. Hence, readers are encouraged to review those Web 2.0 studies to find interesting findings and innovative pedagogical procedures, such as, for instance, virtual reality in the Web 2.0 Second-Life instantiation (Kruk, 2014) and the present-day format (Alemi & Khatoony, 2020).

The past twenty years saw a great need for build-up of technical and techno-pedagogical skills of English language teachers, and our Journal, as one of the few academic publications, actually tried to respond to this problem on a constant basis. Frequent appearances of technology tutorials, initially in the form of a separate column "A Word from a Techie" mainly authored by **Ferit Kilickaya**, then in the form of practical articles outlining steps of using selected websites or software and giving practical activities for their use. Apparently, there is still a need for such publications, as evidenced by our recent examples (including Frazier, Lege & Bonner, this issue), with only changing applications and systems to be explained to readers.

With the Open Source movement and the emergence of Moodle in 2002 and its popularisation in 2003-2005, much research interest was directed towards open and distance learning, examination of learning management systems, and design of personal learning environments within Moodle, LAMS (Alexander, 2008; 2009) and other LMSs. This highly prominent thread of publications in TEwT culminated in 4 thematic volumes devoted to LAMS Learning Management Systems (volume 9 issue 2, 2009 - https://www.tewtjournal.org/issues/past-issue-2009/past-issue-2009-issue-2/; volume 9 issue 3, 2009 - https://www.tewtjournal.org/issues/past-issue-2009/past-issue-2009-issue-3/; volume 10 issue 1, 2010 – https://www.tewtjournal.org/issues/past-issue-2011/past-issue-2011-issue-1/; volume 12 issue 2, 2012 - https://www.tewtjournal.org/issues/past-issue-2012/past-issue-2012-issue-2). Our Journal is, most probably, the only such publication venue which treated the topic of the highly interesting LAMS platform and its associated area of Learning Design so extensively, publishing over 40 articles on different aspects of its use from both theoretical and practical perspectives. Our thematic volumes on LAMS and Learning Design were later republished by University of Nicosia Press, to ensure wider dissemination (Dalziel, Alexander, & Krajka, 2010; Alexander, Dalziel, Krajka & Kiely, 2011; Alexander, Dalziel, Krajka, Dobozy, 2013).

Also, over those last twenty years other themes appeared to be prominent and significant enough that we decided to explore them in greater depth by devoting special issues. These were Webheads in Action community of practice (volume 6 issue 3, 2006, https://www.tewtjournal.org/issues/past-issue-2006/past-issue-2006-issue-3/); training of online teachers (volume 9 issue 2, 2009 – https://www.tewtjournal.org/issues/past-issue-2010/past-issue-2010-issue-2/), task-based technology-mediated language teaching (volume 15 issue 2, 2015 - https://www.tewtjournal.org/issues/volume-2015/volume-2015-issue-2/) and computer-assisted English for Academic Purposes Instruction (volume 20 issue 5, 2020 – https://www.tewtjournal.org/volume-20/volume-20-special-issue/). Thanks to these thematic volumes selected areas of ELT methodology were given much more systematic coverage, hopefully, with benefit for the EFL and CALL community. Here, our gratitude goes to **Vance Stevens, Ursula Stickler, Anna Franca Plastina** and **Reza Dashtestani** as Guest Editors for placing trust in *Teaching English with Technology* as a proper publishing venue as well as for their hard work to make the special issue publication possible.

It goes without saying that the new face of EFL/ESL instruction, the transfer of the learning process into the technology-enhanced classroom, makes it much more challenging for the teacher in the technology-rich classroom (Chapelle and Hegelheimer, 2004; Compton,

2009; Hauck and Stickler, 2006). Teacher preparation gained during university education, often a number of years ago, even supplemented with the skills of teaching online gained in the CALL era quite recently, might not be sufficient to cope with the demands of technology-enhanced classroom of today or tomorrow. Hence, constant reflection is needed into teacher roles, most effective tricks, content presentation and integration techniques, in order to make instruction as effective as possible and to convince technophobic instructors to become enthusiastic or at least mildly positive supporters of computer-based EFL. We hope that our work on the Journal has made some contribution to more effective teaching, especially in these difficult times.

The current research interests and a look forward

This Anniversary Issue of *Teaching English with Technology* shows some of the current interests of CALL researchers worldwide as well as indicates the paths of possible future action. To start with, the use of CALL to assist language teachers in emergency situations is explored by **Husnawadi** (Indonesia), who shows how Flipped Classroom anchored in technology-mediated task pedagogy can facilitate and promote students' learning in the post-earthquake EFL writing instruction. Needless to say, the ideas and solutions contained in the article will be more than useful in all kinds of emergency teaching contexts, including synchronous distance teaching in the times of the COVID-19 pandemic.

Even though telecollaboration has been the focus of interest of the CALL community for the whole time of publication of our Journal, it still deserves careful and systematic investigation from a variety of perspectives. **Ricardo Casañ-Pitarch** and **Miguel Ángel Candel-Mora** (Spain) show in their article how this well-established pedagogical practice helps develop the target skills following an integrated learning approach, bringing together learners' digital competence, English language skills for professional purposes, and knowledge on recycling matters into a telecollaborative project work design.

Two more articles are devoted to the methodology of flipped learning, "Prospective primary school EFL teachers' beliefs about 'flipping'" by **Mª Victoria Fernández-Carballo** (Spain) and "Students' perceptions of the incorporation of flipped learning into L2 grammar lessons" (**Ahmad Noroozi, Ehsan Rezvani** and **Ahmad Ameri-Golestan**). The former deals with the concept of CALL teacher education and flipped learning is evaluated through both quantitative and qualitative techniques by prospective teachers as a valid and preferred teaching procedure, compared to traditional instruction. The latter looks at flipped instruction

in grammar teaching from the learners' perspective, revealing that the participants receiving flipped learning instruction found it satisfactory, engaging, and effective.

Blended learning is another prominent computer-mediated methodology that finds its coverage in the Anniversary Issue. **Herri Mulyono, Deana Ismayama, Anggi Rizky Liestyana** and **Cahya Komara** (Indonesia) conducted solid empirical verification of a large sample of teachers' perceptions of blended learning, coming to the conclusion that EFL teachers' views about blended learning were different regarding their gender, although the difference was not statistically significant, while regarding teaching levels, teachers' perceptions about skill and experience and motivation to exercise blended learning was statistically different.

Evaluation of CALL software is the line of research that, similarly to telecollaboration, permeates the twenty years of our Journal, reappearing in different issues in reference to new software or online courses. This time, the *DynED* software is taken under close scrutiny by **Güler Shaikh, Ömer Koçak** and **İdris Göksu** (Turkey), who conducted a large-scale (136 subjects) experimental study of the software's effectiveness, showing that the use of *DynEd* significantly improved both the language skills and attitudes of the students in EFL. However, *DynEd* did not make any difference in students' attitudes towards EFL according to grade level and gender.

An interesting area for research is opened by **Mehrak Rahimi** and **Seyyed Abolfazl Babaei** (Iran), who examined the relationship between reading strategy use and reading comprehension as mediated by reading rate amongst advanced EFL students who received eye movement training by Rapid Visual Presentation (RSVP) technology. The results support the hypothesis that reading rate is a contributory factor in understanding reading passages and integrating speed reading training using the-state-of-the-art technologies into reading instruction should be considered in EFL reading courses.

Finally, cutting-edge Virtual Reality technology is shown in the practical and applicative dimension in the contribution by **Erin Frazier, Ryan Lege** and **Euan Bonner** (Japan). The practical article introduces the *VR Application Analysis Framework* (Lege, Bonner, Frazier, & Pascucci, 2020) to assist educators in scaffolding existing commercial off-the-shelf (COTS) applications for use in classroom activities through four key lenses: *immersive capacity*, *cognitive load*, *purpose*, and *communicative capability*, analyzes the strengths and weaknesses of an example COTS VR application, *Tilt Brush* and exemplifies the ideas in three lesson plans for *Tilt Brush* that demonstrate how VR could be used in the language classroom.

It is with this formidable lineup that we present the Anniversary Issue of *Teaching English with Technology* to our readers. We do hope that a wide range of topics, platforms, media, tools and tasks will enable many EFL/ESL/EAP/ESP teachers and researchers to find answers to their classroom problems or inspiration for new research undertakings.

At that point, our great thanks go to all the editorial assistants who have helped us in the production of the Journal over those twenty years: **Kamila Burzyńska, Marcin Mizak, Robert Oliwa** and **Hussein Meihami,** without whose constant engagement and devotion, the Journal would not have reached its current status, prestige and recognition. Anonymous heroes, all our Reviewers, deserve greatest praise possible for doing their voluntary article evaluation work, helping submissions reach the quality expected by the CALL community worldwide. Finally, warm thanks go to all our Readers, both from academia and the practitioner classroom, for being with us over those twenty years and keeping up to date with state-of-the-art ideas for teaching English with technology. Without your reading, citations, letters to editors and journal contents dissemination, we certainly would not be in the same place as we are now, most probably, we would no longer exist at all!

And where are we now? According to Scopus, 139th place out of 830 journals in the area of Language and Linguistics, 83rd percentile, CiteScore value rise from 0 in 2014 and 2015, through 0.2 in 2016, 0.4 in 2017, 0.8 in 2018, 1.6 in 2019 to predicted 2.0 in 2020. It is only thanks to our Authors, Reviewers and Readers that we have achieved such great progress in Scopus metrics, indicating wide readership and recognition of research published in Teaching English with Technology. Great thanks to all of you! We wish you good reading and much health in these hard times!

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STUDENTS' PERCEPTIONS
OF FLIPPED CLASSROOM-MEDIATED TASK:
INSIGHTS FROM AN INDONESIAN POST-EARTHQUAKE
EFL WRITING PEDAGOGY

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Abstract

Despite its positive impact on students' learning and learning outcomes, studies documenting empirical evidence on how Flipped Classroom anchored in technology-mediated task can facilitate and promote students' learning in post-Earthquake EFL writing pedagogy context remain scarce. To fill this void, this action research, documenting both quantitative and qualitative data, anchored in González-Lloret's and Ortega's (2014) technology-mediated task framework, aimed to garner students' perceptions towards the use of FC-Mediated Task (FCMT) for learning essay writing; how they perceived this instructional approach compared to face-to-face only classes; and what challenges appeared while implementing this approach for the teaching and learning of writing in such a post-earthquake pedagogical context. The statistical evidence showed that the majority of the students positively perceived the use of FCMT for the learning of essay writing. The students also preferred the use of this approach to FTF only classes for learning to write essays in English in terms of the effectiveness and efficiency, engagement, language skills development and motivation. Pedagogical and technological challenges remained their prominent barriers in the implementation of this approach.

Keywords: Flipped Classroom-Mediated Task; EFL; TBLT

1. Introduction

Acquiring the writing skill is highly cognitively and linguistically challenging as it requires the ability to generate and organize ideas, and turn them into coherently and cohesively comprehensible texts (Seow, 2002). Adequate learning hours, writing practices, authentic learning materials, and language use beyond the classroom are critical to L2 writing instruction. However, a major problem faced by all schools and universities, particularly the State Islamic University on the Island of Lombok, Indonesia, was the catastrophic impacts of the earthquakes a magnitude of 6.4, 7, 6.2, and about a thousand aftershocks stroke the Island from August to October 2018, severely damaging the school buildings and psychologically leaving the students

and lecturers in a traumatic stress condition. As a panacea, the Islamic University initiated to employ tents as the emergency classrooms in the odd semester (August-December 2018) (see Figure 1 below).

Figure 1. Temporary Classrooms under the emergency tents

Nonetheless, most of these classes were inconvenient for both the lecturers and students because the rain and hot humid weather respectively made the classroom muddy and stuffy. Also, the lecturer's and the students' absences resulted in numerous missing materials that the latter were expected to learn. Additionally, the deficient pre-class preparation was responsible for the students' less participation in the class. Such drawbacks hampered them from achieving the learning objectives.

In the following even semester of the academic year 2018-2019 (February-May 2019), during which the Islamic university buildings were being renovated, the English Study Program, where the current study was conducted, ran its administration at a private Islamic Senior High School, where secondary school students attended the classes in the morning, while the university students presented in the afternoon from 1:30 p.m. Consequently, the learning hours slumped from 100 to 60 minutes a week, which was insufficient for the writing class.

To deal with the aforementioned issues, a novel instructional approach, such as making use of the online learning system which would not replace the lecture-based course and which would also allow the students to study at home at their own pace and convenience, is pivotal. One of such prominent approaches that has recently gained popularity in the realm of education is Flipped Classroom (FC) (Cabi, 2018).

FC allows the students to learn conceptual knowledge online and do practical tasks in the FTF classroom (Adnan, 2017; Cabi, 2018; Mehring, 2016; Mehring, 2018). It is a learner-centered approach that engages students in learning a larger proportion of classroom tasks online, e.g., teachers share the materials, such as videos, soft-file, learning webs, discussion and give feedback as well as exercises; and in which the students only learn practical tasks, e.g., writing tasks, in the FTF classrooms. This way maximizes the learning hours by engaging the

students in a collaborative discussion to solve particular learning problems and to do more practices, rather than merely listening to the lecture in the in-site classroom (Zainuddin & Halili, 2016).

Current studies have documented pedagogical benefits of FC in the L2 context, such as promoting the students' English idiomatic repertoire (Hsieh, Wu, & Marek, 2017); learning, motivation, and content knowledge (Zainuddin & Attaran, 2015); writing skills and opportunities to learn beyond the classroom (Buitrago & Díaz, 2018). However, studies documenting empirical evidence on how FC grounded in a SLA theory, say Task-Based Language Teaching (TBLT), can facilitate and promote students' learning, particularly in the post-earthquake writing pedagogy, remains unexplored. González-lloret (2017) and Ziegler (2016) opine that marrying TBLT and technology promotes L2 learning outcomes as theoretically justified by some previous studies (e.g., González-lloret, 2017; Ziegler, 2016; Baralt & Gómez, 2017).

Based on the rationales above, this study, anchored in González-Lloret's and Ortega's (2014) Technology-Mediated Task framework, aimed to examine how the use of FC-Mediated Task (FCMT) for the teaching of essay writing in an Indonesian post-earthquake EFL writing instructional context facilitates and promotes the students' learning. The following overarching research questions guided the whole part of this study.

1. What were the students' perceptions towards the use of FCMT for learning essay writing?

2. What were students' overall experiences for the use of FCMT for learning essay writing compared to other conventional lecture-based courses in the post-earthquake writing pedagogy?

3. What challenges were faced by the students and the writing instructor regarding the application of FCMT in the learning context?

2. Literature review

2.1. Technology-mediated tasks

As the sub-branch and product of CLT, TBLT has gained popularity among L2 researchers (Ellis, 2009). This "process-based approach" derives from the work of Dewey known as 'experiential learning' or 'learning by doing', which emphasized students' active participation,

meaning and use of language for communicative purposes (Ziegler, 2016; González-Lloret, 2017). Willis (1996) regards 'task' as any goal-oriented activity which allows learners to use the learnt language to achieve certain learning outcomes. Ellis (2009) views tasks as the activities that drive language learning. Nunan (2004) defines TBLT as the pre-, during, and post-tasks that enable learners to manipulate, understand, create and actively partake in the use of English, in which grammatical knowledge is oriented towards meaning making, not towards grammatical exercises.

With regard to TBLT and technologies, Ellis (2018) states that TBLT and CALL first made its way to language education in the same period, in 1980s. Likewise, the interplay between TBLT and technologies can be associated with the penetration of both the Communicative Approach and CALL into the realm of education in the early and late 20th century, which entails similar characteristics, such as the emphasis on authenticity, meaningful resources, and real-world activities (Thomas & Reinders, 2010). Although L2 educators have been interested in the use of digital technologies of Web 2.0, such as blogs, chats, wikies, etc., their use will remain less effective unless grounded in the L2 learning theory (González-Lloret & Ortega, 2014; González-Lloret, 2017). With regard to FC and technologies, its application should focus on developing students-centered learning that provides a smoother access to learning and materials for both teachers and learners through discussion forum posts, videos, quizzes etc. As FC is frequently applied using online learning platforms, Web 2.0 applications, Facebook, personal learning websites, and some free e-learning platforms such as Edmodo, Schoology and etc., the employment of TBLT underlying its learning design may give additional values to the language learning process. González-Lloret and Ortega (2014) and González-Lloret (2017) offer TBLT as one of the best communicative approaches that can underlie the effective practice of language learning using Web 2.0 technologies as it may actively engage learners in doing and creating real world tasks. Drawing on several recent studies on TBLT and technologies, González-lloret and Ortega (2014, p. 5-6) offer the following five primary principles of technology-mediated tasks, which framed the present study:

1. *Primary focus on meaning*: The learning should accentuate meaning, and language form is taught implicitly despite the provision of the preceded learning goal.

2. *Goal orientation*: The learning activities should engage students in the process of task completion that offers communicative purposes and orients towards both (non)communicative outcomes driven by information gap or transfer.

3. *Learner centeredness*: Task should be based on needs analysis, knowing what students want and need, and allow them to employ their non(linguistic) and digital abilities.

4. *Holism*: Task caters authentic and real-world language use that entails grammatical, functional and meaningful learning of language.

5. *Reflective learning*: Task does not only encourage language use for task execution or activities but also provides reflective learning for the learners.

2.2. Flipped classroom in EFL context

Lee and Wallace (2017) advocate that CLT fails in the EFL context due to the contextual barriers, such as the absence of English use beyond the classroom, and insufficient learning hours; thus, the students gain less knowledge, learning outcomes and interaction, which hampers their language development. FC provides an alternative to the contextual constrains because it affords the learners more opportunities to learn in and beyond the classroom in a flipped manner.

The employment of technology in the EFL context has brought about more learner-centered and communicative learning (Mehring, 2016). FC creates such learning characteristics as it facilitates students' interaction before FTF class takes place, peer feedback pertinent to the tasks from the teacher, individual and collaborative learning, access to authentic learning materials, and encourages them to be more participative in the classroom as they gain more time for preparation (Mehring, 2018; Adnan, 2017). For this reason, FC has recently gained its popularity among instructors and researchers as a pedagogical alternative for the traditional classroom (Cabi, 2018).

Hsieh, Huang, and Wu (2017) investigating the effect of FC on Taiwanese students' mastery of English idioms revealed that it enhanced their motivation and participation in the class. Although the use of both conventional lecture-based instruction and FC improved the students' idiomatic knowledge significantly, the latter approach made higher significant idiomatic knowledge gain at the significant level (p < .001) and mean difference of the post-test at 14.04. Similarly, Zainuddin and Attaran (2015) unveiled that the students at a Malaysian university were positive about the use of the learning approach. It was also found that the use of FC motivated them to learn. In particular, 67% of the students perceived that the instructional approach promoted conducive communication between them as learners; lower ability and shy students were encouraged to communicate, question and respond; 78% of them opined that it

facilitated learning beyond the classrooms; and 77% and 78% of them respectively perceived that the learning approach escalated their motivation and content knowledge.

With respect to the teaching of L2 writing, Buitrago and Díaz (2018) revealed that FC afforded more opportunities and time for students to do writing tasks. Learners were more capable of writing complex sentences using connectors, correctly identifying grammatical errors, using appropriate lexical choices and ways of writing, and understanding rhetorical patterns from various essay genres. It was also found that FC promoted the students' positive attitudes toward the learning. Adnan (2017) investigated the effect of FC and non-FC learning approach and documented students' learning experience at a Turkish university by means of Facebook as the e-learning platform. The statistical evidence showed that the students' results from the two different classes did not have a significant difference in terms of Quizzes and Portfolio, yet they were significantly different in terms of essay score given the value *p <.05 (p = .010 < .05),* which indicates that the use of FC was more effective in improving the students' essay writing skills. The qualitative evidence also showed that the students gained better understanding of the content; they became less stressed, more disciplined and motivated to learn, as well as more actively engaged in FTF classes.

2.3. Flipped classroom in the Indonesian EFL context

In the Indonesian EFL context, FC is a new form of instruction-based technology. This is evidenced from a lack of studies pertinent to its use published in internationally high-indexed journals. To the author's best knowledge, there have been three research articles pertinent to the implementation of FC recently published in the international journals by the time of writing this paper (August 2019), albeit two studies recorded in the state as evidenced in the systematic review study by Turan and Akdag-Cimen (2019). Afrilyasanti et al., (2017) investigated how 30 Indonesian High School students perceived the use of FC in learning writing. The findings indicated that the students positively perceived FC for learning writing. The use of pre-class activities (online learning, using videos) was deemed to improve their understanding about the concept of writing compared to their peers who did not watch the videos. However, the students in the study also faced some challenges, namely inadequate access to the internet, lack of facilities, and overloading with tasks from other subjects at the same time. The students also perceived that the learning method could improve their writing skill. Similarly, Zainuddin (2017) found that the use of FC more actively engaged the students in the individual and collaborative learning online, and motivated them to learn, afforded more chances to learn earlier before FTF class, and gained direct feedback from the lecturer. The students also

positively perceived the use of the instructional approach. Afrilyasanti et al. (2016) also investigated the impact of FC on the writing skills of students with different learning styles. 62 students were divided into experimental and control groups. The statistical evidence showed that FC significantly improved the students' writing skills (t-count = 10.893; p-value= 0.000). Another finding also showed that the students with accommodating and converging learning styles felt the significant benefits of learning through FC, while it did not apply to those with assimilating learning style.

Nonetheless, the majority of the aforementioned studies are not anchored in any SLA theory, TBLT for example. González-Lloret and Ortega (2014) and González-Lloret (2017) argue that learning L2 using technologies without being undergirded by a SLA theory or principles will only be no more than an entertainment. Moreover, there remains a dearth of studies quantitatively and qualitatively collecting empirical evidence on students' perception pertinent to FC application during post-earthquake EFL writing pedagogy in the literature, which may provide theoretical and practical insights on how to teach English under such a remote learning condition, where facilities and learning hours are of the primary concern. Further, none of the research cited in this study employed a free e-learning platform, which actually serves for virtual learning purposes, such as Schoology, one of the many available web-based Learning Management Systems (LMS) that allows teachers to distribute materials, monitor, and assess students interactively through its various features, such as discussion forum, assessment grading and etc. (Robinson, 2017). Zainuddin and Halili (2016) reviewed a large number of studies regarding the application of FC from 2013 to 2016 to discover that none of the studies under review employed the aforementioned web-based LMS (see Zainuddin & Halili, 2016, p. 323). For these reasons, the current study aimed to provide empirical evidence on how the application of FCMT through Schoology platform can facilitate and promote students' learning in the Indonesian post-earthquake EFL writing pedagogical context.

3. Methodology

3.1. Research design

This study reports findings of broad Action Research study (AR). It was deployed to resolve the contextual problems mentioned earlier and improve the learning. Burns (2010, p. 2) advocates that AR is a sort of "reflective practice", in which the teacher simultaneously becomes the researcher. Hence, my dual role in this research was being the English writing instructor and researcher at the same time. This study adopted four general phases of AR as

first coined by Kemmis and McTaggart (1988) cited in Burns (2010, p.8), namely Plan, Action, Observe, and Reflect. This set of AR stages was applied in two research circles throughout the semester

3.2. Participants and the context

This study took place in an English Essay Writing class carried out once a week at an English Study Program of an Indonesian State Islamic University situated in Lombok Island, Indonesia. 30 participants of Sophomore Pre-service EFL students, whose language levels varied from elementary to pre-intermediate, were involved in the study. The students had never experienced FC learning model.

3.3. Design and procedure

The goal of the course was to develop the students' ability to write different genres of essay in English, such as descriptive, narrative and expository. The primary textbooks used were the second edition of *Writer's Resources: From Paragraph to Essay* by Robitaille and Conelly (2007) and the third edition of *Writing to Communicate: Paragraphs and Essays* by Boardman and Frydenberg (2008), including the use of other relevant materials and videos taken from the internet shared through the e-learning platform, Schoology, a free user-friendly LMS for teachers and students that offers various pedagogical features, such as an announcement board, discussion forum, quiz, assignment submission, folder, add-links, grading and grading setup (visit https://www.schoology.com/) (Robinson, 2017).

The class began with the introduction to the course objectives, assessment, and use of Schoology. 70% of the students' attendance was allocated for online class because the larger portion of the overall classroom activities were conducted online, while the remaining 30% was for FTF classroom where the students only did the assignment given online regarding writing practices, presentation, debate, brainstorming, collective and individual feedback. A poll was created to collect the students' preferences for learning (FTF only, online only or a combination of the two), which showed that the majority of them preferred the combination of the two (see Figure 2 below). It was done because TBLT must begin with a needs analysis at the outset (González-Lloret & Ortega, 2014; Baralt & Gómez, 2017), which comprise the information regarding the students' preferences in the use of technological devices for mediating the learning process (González-Lloret & Ortega, 2014).
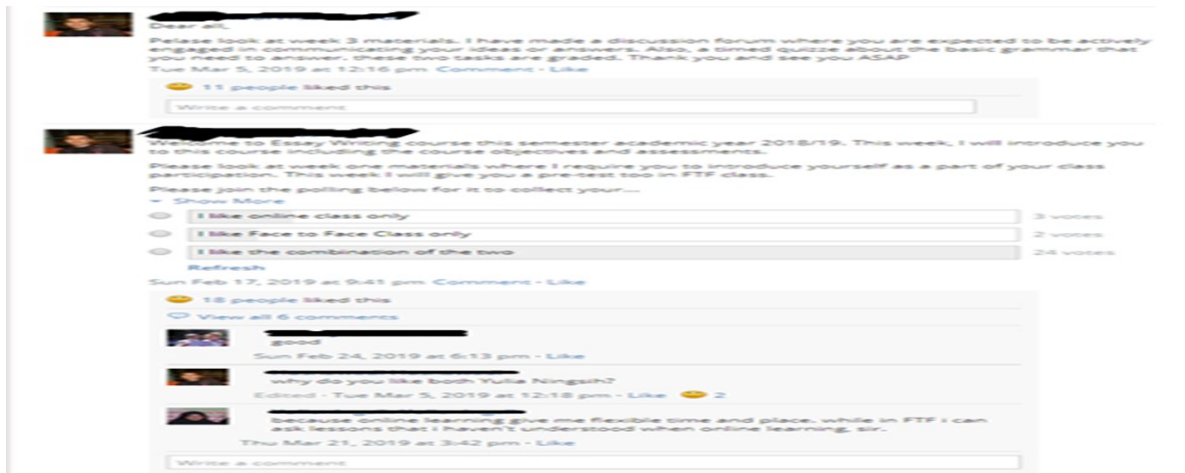
Figure 2. Students' learning preferences

Table 1 provides a summary of the learning activities throughout the semester (see below). Although the primary focus is on meaning, the importance of grammatical awareness necessary for executing each of the writing tasks plays a crucial role in the writing accuracy. For that reason, Littlewood (2007) advocates the need for adapting rather than adopting TBLT concept in the EFL context, where social, cultural and educational values differ from the context of its origin, L2 context. This, however, does not necessarily detach the principles of technology-mediated task as the form-focused instruction is also inclusive to the learning approach (Ozkoz & Elola, 2014).

Table 1. FCMT learning activities throughout the semester

Week	Lesson	Online 70%	FTF 30%
2,3,4,5	Descriptive Essay: Describing favorite tourism destination on the Island of Lombok	**Discussion forum:** **Video:** • What is and how to write a descriptive essay **Grammar:** • How to use present tense (present, continuous, perfect and perfect continuous • Coordinating connectors • Intro to using Free mind mapping software • Transitions **Reading** • Textbooks (chapter 6, 7, & 8 (Robitaille and Conelly, 2007);	**Writing Practice** • Practice of writing descriptive essay • Collaborative Presentation of descriptive essay using FreeMind mapping software **Feedback** • Peer-gap noticing • Collective Feedback • Teacher-student feedback (individual conference)

		Chapter 4, Boardman and Frydenberg, 2008). **Feedback:** • Collaborative peer-feedback **Quiz:** • Present tense • Coordinating connectors	
6,7,8	Narrative Essay: Retelling the most memorable story	**Discussion forum:** **Video:** • What is and how to write a narrative essay • Writing a silent movie scene (listen to a short film) • What is cohesion and coherence? Why are they important? **Grammar:** • How to use past tense (present, continuous, perfect and perfect continuous) • Coherence and cohesion • Subordinating Connectors • Transitions **Feedback:** • Collaborative peer-feedback **Quiz:** • Past tense • Subordinating connectors	**Writing Practice** • Practice of writing Narrative essay • Individual random presentation of memorable story **Feedback** • Collective feedback from the instructor • Individual feedback **Test** • Mid-term test
9,10,11,12	Agree and Disagree: Arguing for or against the implementation of the Indonesian National exam	**Discussion forum:** **Video:** • What is and how to write an Agree and Disagree essay • Paraphrasing strategies and exercises • Collective Online Brainstorming on national exam **Feedback:** • Collaborative peer-feedback **Quiz:** • Paraphrasing	**Writing Practice** • Oral debating on banning the national exam • Mind-mapping ideas • Writing an agree and disagree essay on banning the national exam. • Paraprhasing **Feedback** • Teacher-student feedback (individual conference) **Test** • Post-test

3.4. Data collection tools and procedures

This study drew on multiple sources of data, namely a questionnaire, a semi-structured focus group interview, and students' and instructor's reflective journals. To answer the Research Question No. 1 (RQ1), a questionnaire adapted from Hsieh et al. (2017) was distributed to the students at the end of the course and computed using SPSS 20 to generate the descriptive statistics. It comprised 14 items constituting four constructs: 5 items for motivation, 4 items for effectiveness, 4 items for engagement, and 1 item for overall satisfaction with 5-point Likert scale indicating "Very disagree, disagree, neutral, agree and very agree". The phrase "mediated-task" was added to the phrase "Flipped classroom"; hence, it states "a flipped classroom-mediated task is a better way of learning". The reasons for using the questionnaire was its validation by two other experts (Hsieh et al., 2017) high reliability (the Cronbach's Alpha value α=.88), meaning that the internal consistency of the items was high (Field, 2009).

Semi-structured focus group interview and reflective journals of the students and the writing instructor were used to garner the data pertaining to RQ2 and RQ3. Twelve most participative students were purposively chosen for the interview and were audio-recorded using a smartphone. In addition, the data gained from the reflective journals and some visual representations of the learning activities were used to illustrate and corroborate both the quantitative and qualitative findings garnered respectively through the questionnaires and the interview. These qualitative data were analyzed using Braun's and Clarke's (2016) thematic data analysis procedures: understanding the data, initial codes generation, identifying themes, themes review, theme definition and naming, and reporting. To validate the findings, two other English language translation experts were invited to review the translation results. Also, the analysis results were confirmed to the participating students to ensure their intended meaning and to avoid misinterpretation.

4. Findings and discussion

The deployment of the FCMT in this learning context was overall perceived positive as it effectively and efficiently facilitated and promoted the students' learning and gave them more learning opportunities. The students generally found it motivating, engaging, and satisfying.

RQ 1: Students' perceptions towards the use of FCMT for the learning of essay writing

The statistical evidence showed that overall the students perceived the use of FCMT as positive: motivating (M=3.84); effective (M=3.60); engaging (M=3.72); and satisfying (4.17) (see Figure 3).

Figure 3. Descriptive statistics of students' perception of FCMT learning experience

Constructs	N. Items	Min.	Max.	Mean	SD
Motivation	5	1	5	3.84	0.70
Effectiveness	4	2	5	3.60	0.55
Engagement	4	1	5	3.72	0.57
Overall Satisfaction	1	2	5	4.17	0.61

N=28

This quantitative finding corresponds to that of the qualitative pertaining to RQ2.

RQ2: Students' overall learning experiences of using FCMT compared to other conventional lecture-based courses

The qualitative evidence unveiled that the use of FCMT for learning to write essays in English was perceived more positively compared to the use of FTF-only classes. Four themes were generated, namely effective and efficient learning, learning engagement, improvement of writing and related language skills, as well as motivation and learning enjoyment. Due to word limits of this paper, sample excerpts from the focus group interview, reflective journals of both the students and lecturer, and images depicting the learning activities were succinctly presented in the Table 2 beneath.

Table 2. Summary of the students' perceptions on the use of FCMT

Themes	Sample Excerpts and Images
Effective and efficient learning	*"………the use of FCMT after the earthquake hit my island is helpful for me. I find it easier to find the course. Unlike in FTF where students only have the materials at one time, FCMT offers a combination of both FTF and online learning using Schoology that provides a 24-hour course distributed by the lecturer."* [Student 9 focus group interview 23/05/2019]
	"I think using FCMT is very efficient because it was impossible to learn writing for 60 minutes only by FTF". [Student 1 focus group interview 23/05/2019]
	"The use of FCMT for learning essay is better and more effective…… because of the reduced learning hour from 100 minutes to 60minutes….. The lecturers in FTF classes often run out of time as the classes will be used by another lecturer, for they immediately changed the topics of the courses despite our less comprehension….." [Student 1's reflective journal]
Learning engagement	*".....the use of FCMT promotes my participation in FTF class as the lecturer gives me opportunities to discuss related topics via online class in Schoology."* [Student 4 Focus group interview on 23/05/2019]
	"……I can learn everywhere at any time by the online class via Schoology". [Student 3 focus group interview 23/05/2019]
	"I have much more time to learn and prepare myself before entering the FTF classroom via the videos shared and discussion forum created by the lecturer" [Student 4's reflective journal]

"It was noticeable that the students who watched the video about paraphrasing strategies in week 10 and did the task earlier was more active in the class than those who did not. When I was reviewing the online lessons about Paraphrasing strategies in FTF class for example, the students doing the task were responding quickly to me and answering the questions perfectly....." [The instructor's reflective journal]
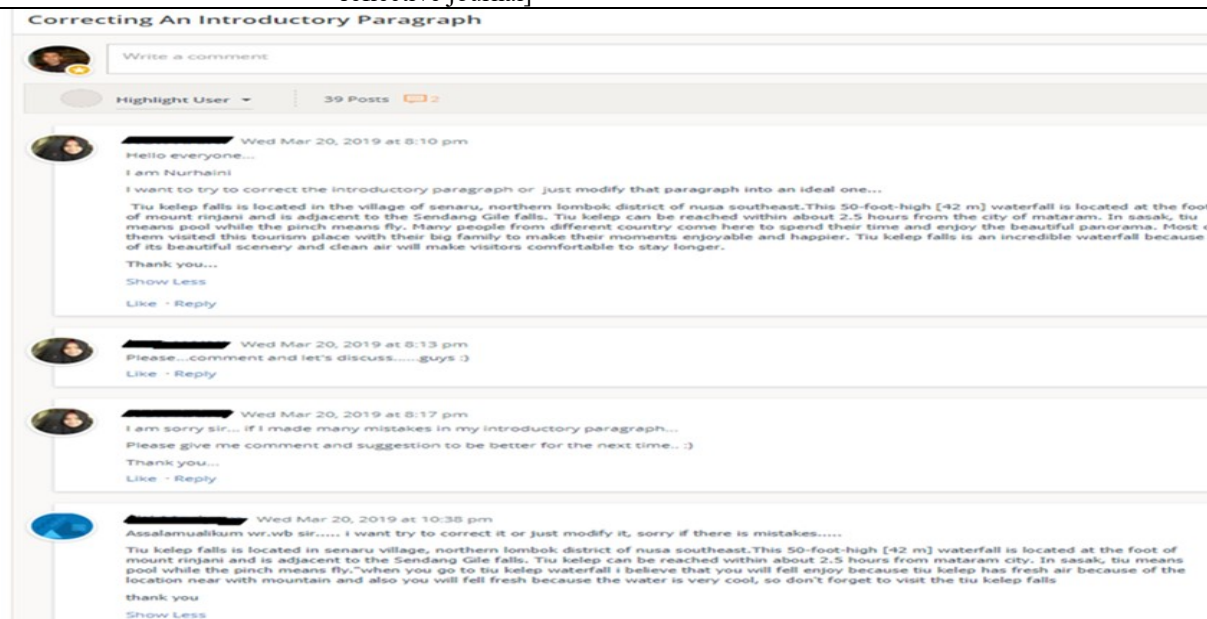
Figure 4. Online collaborative feedback

Improvement of writing and related language skills	*"I can understand the learning materials more comprehensively because I can ask about what I do not understand online in FTF class…….".* [Student 1 in Focus group interview on 23/05/2019]
	"……………..while in FCMT, the tasks given, such as watching the videos were complete in that it allowed me to improve not only my writing, but also listening skills and vocabulary as I listen to native speakers." [Student 2 in Focus group interview on 23/05/2019] *"The materials and videos shared by the lecturer helped me understand better about how to write essay writing, enriched my vocabulary. Also, the discussion forum was helpful for improving my writing skills, and the feedback from my friends and lecturer allows me to better my writing, for example, in writing thesis statement….."* [Student 5's reflective journal]
	"It is noticeable that the students could collaboratively share their ideas and gave feedback orally to each other when presenting their descriptive essay using MindMapping software. Also, the students were actively engaged in debating for and against the implementation of the Indonesian national exam for the authorship of agree and disagree essay…..". [The instructor's reflective journal]

Collaborative brainstorming or case building   *Presenting arguments on the Indonesian national exam*

Figure 5. Collaborative brainstorming and argument presentation

Figure 6. Online debating

Motivation and learning enjoyment	*"I was encouraged to be more active as I could see that my score was increased the more I participated in the online class."* [Student 6 focus group interview 23/05/2019]
	"In traditional class, we just have a teacher-centered teaching organization. In this class (FCMT), particularly online class, we are forced to be on time in submitting our tasks. If we are late for one second, we will be at risk. So the first thing I learn is time management." [Student 1 focus group interview 23/05/2019]
	"FCMT is an interesting approach that it reduces the learning boredom. This approach compliments FTF and online learning……. The use of Schoology as a learning platform in this method motivates me to be more active online because it shows my grade. The more we participate, the better score we gain". [Student 2's reflective journal]

RQ3: The challenges faced by the students and writing instructor using FCMT for the learning of Essay Writing

Drawing on the data taken from the focus group interview and students' and the writing instructor's reflective journals, pedagogical, and technological issues remained the primary learning challenges. The following Table 3 provides succinct accounts of such findings.

Table 3. Summary of perceived challenges on the use of FCMT

Themes	Sample excerpts
Pedagogical challenges	*"Duration for quizzes should be extended because it is difficult for us to think quickly in a short period of time……."* [Student 9 focus group interview 23/05/2019]
	"…..What needs to be improved in FCMT is the feedback from the instructor. When my friends made some mistake online, the lecturers did not give much feedback on it……". [Student 7 focus group interview 23/05/2019]
	"What I dislike about FCMT is that our friends often copy paste our answer in the discussion forum." [Student 7 focus group interview 23/05/2019]
	"Drawing on the interview in the mid-week, when asking some of the students about how they progressed in the class, the one that the students complaining was the copy paste of their comments by one of the students….." [Instructor's reflective journal]
	"I felt that I learn more from the use of FCMT, yet I find it difficult to manage my

	time to study twice a week [one online learning for pre-class activities, and the other for in class activities]………". [Student 12 Focus group interview: 23 May 2019].
	"………I had a lot of other homework from other lecturers, so it is sometimes too demanding for me……." [Student 8 focus group interview: 23 May 2019]
Technical challenges	*"….I find it hard to log in to Schoology due to limited internet connection. However, we still have another alternative, such as a public Wi-fi in my dormitory. It is accessible for me because I have Wi-fi in my dormitory."* [Student 4 focus group interview 23/05/2019]
	"….Also, when we work on the quiz, the connection is error and all the answers are blank….." [Student 12 focus group interview 23/05/2019]
	"…..there are some problems that the other students faced using this approach such as limited internet access and facilities, such as laptops to support the learning. It is sometimes problematic when doing the quizzes online during a low internet connection……". [Student 10's reflective journal]
	"……….lecturers sent the works in the absence of announcement or notification. We know that most students do not have smart phones that support their study in online learning, for example, I have smartphone, but it is impossible for me to open Schoology every day. It is hard for me to notice a new task given online. As a result, students who do not submit the task will have a low score……" [Student 11 Focus group interview 23/05/2019]
	"I was finding it harder to set up the class in Schoology platform in the beginning, such as setting the grading period, dividing it into several grading categories, sharing one lesson to other groups, etc. However, I could figure them out by watching videos on Youtube on how to use Schoology for teaching, and throughout the lesson, my technical skills at using this learning platform were improved……" [Instructor' reflective journal]

The present study investigated how EFL students perceived the implementation and challenges of FCMT for learning essay writing, particularly in the post-earthquake pedagogy. The two primary rationales drove this study: contextual and theoretical issues. The former refers to the inadequacy of classrooms and learning hours, which was 60 minutes a week for the students to study Writing; while the latter relates to the gap in the literature.

The statistical evidence showed that overall the students positively perceived the use of FCMT in learning Essay Writing. It is also unveiled that the application of the learning approach was pedagogically fruitful for both the students and the writing instructor in the post-earthquake pedagogical setting, where the classrooms and learning hours remain a concern despite the provision of some instructional and technical barriers that, to some extent, hampered its implementation.

Drawing on the statistical evidence garnered through the questionnaires, the majority of the students were satisfied with the implementation of FCMT for learning essay although two of them strongly disapproved its enjoyment and pleasure. This finding accords with that of Hsieh at al. (2017), who unveiled that the students in their study were overall satisfied with the implementation of the flipped method despite the very disagreement with the preference of the

flipped method over the FTF only. It was because the students had to study harder in the flipped learning model. With this regard, Mehring (2018) suggested that the teachers should gradually implement this approach as it creates a new learning context that gives students an extra load of work than usual. The teacher should prepare the class before FTF for students to be actively engaged in the online class.

The qualitative evidence in the current study also corroborated the assumption that the FCMT was a new approach for learners to have such an intense study, where learning writing is linguistically and cognitively demanding, and that they were overloaded with tasks from other 10 courses throughout the term. Nevertheless, in the second circle of the learning design, the students were given less demanding tasks, which was a part of the continuous needs analysis through reflective practices. In addition, the inclusion of a Web-based app also created some barriers, including unstable internet access and the absence of notification of Schoology learning platform app on their mobile phones. The aforementioned challenges for the implementation of FC faced by the students were justified by the result of the systematic review study by Turan and Akdag-Cimen (2019) that overload with work and technological or internet access remained the prominent learning barriers. Likewise, Afrilyasanti et al. (2017) also uncovered similar findings in that the Indonesian secondary school students faced similar challenges: lack of facilities, inadequacy of internet access and overload with tasks from other lectures.

Nevertheless, the majority of the students in this study positively perceived the implementation of FCMT as the learning approach for the teaching of writing in the post-earthquake learning environment because it was more effective and efficient compared to the FTF class only, giving them more opportunities and time to study at their own pace anytime and anywhere. These findings are correspondent to those of several other studies cited in this study (e.g., Buitrago & Díaz, 2018; Zainuddin & Attaran, 2015; Adnan, 2017; Zainuddin, 2017). In addition to the positive perception of the Flipped Classroom, Buitrago and Díaz (2018) unveiled that the implementation of FC afforded the students more opportunities and time to learn. Another finding of the present study was that the students were more engaged and motivated in learning. The nature of the flipped learning model using Schoology e-learning platform facilitating learning beyond the classroom through timely and marked online discussion forum and quizzes and other features which encouraged the students to learn on time: participating in discussions, doing tasks, submitting assignments and doing quizzes more punctually. The findings were also aligned with the previous studies on the employment of FC. For instance, Hsieh et al. (2017) found that the students were more motivated to learn idiomatic

expressions and more participative in the FTF classroom. Similarly, Lee and Wallace (2017) discovered that the Korean students in the FC were more involved in learning than their counterparts in the non-FC due to online pre-learning activities. Afrilyasanti et al. (2016) also discovered that the students who watched the videos in the online class were more active in the class, which did not happen otherwise. Lee and Wallace (2017) advocated that the affordance of the flipped learning model on learning English beyond the classroom can be the panacea for the absence of English use as a means of daily communication in the EFL context, which has long been regarded as the primary barrier to the target language mastery inasmuch as the students gain less exposure to the target language. They argued that less exposure to input has prevented CLT from achieving its communicative goals in EFL teaching context (see Lee & Wallace, 2017). This indicates that the marriage between FC and TBLT as the variant of CLT as evidenced in this learning design provides the alternative to this learning barrier. The presence of the Web 2.0 technology, such as Schoology, could help instructors reach the students and facilitate learning outside the classroom. With this regard, González-Lloret and Ortega (2014) advocate that the appropriate use of technology-mediated tasks for language learning instruction would promote students' self-confidence, motivation, creativity in interaction; expose them to the target language, create an authentic learning environment, promote cultural understanding; and provide them with the unprecedented amount of input. In this study, it was inevitable that the learning design allowed the students to communicate and share their ideas in English facilitated by Schoology as the learning platform. Such a learning activity represents learner-centered and meaning-focused instruction as some of the characteristics of the technology-mediated task inasmuch as the students were directed to focus on communicating their ideas both in the online discussion forum and FTF.

The current study also showed that students perceived that the deployment of FCMT developed not only their writing skills, but also other related skills, such as speaking, listening, and vocabulary compared to the conventional classes. The native English-speaking videos about the writing concepts and other relevant readings or materials shared by the writing instructor provided the students with the learning opportunities beyond writing skills; as they listened to and imitated the ways native speakers speak English. The finding echoes the previous studies cited in this present study, in which the employment of FC could better improve students' language skills: e.g., writing skills (Afrilyasanti et al., 2016; Afrilyasanti et al., 2017; Buitrago & Díaz, 2018; Adnan, 2017; Lee & Wallace, 2017); idiomatic learning outcomes (Hsieh et al., 2017); speaking skills (Köroğlu & Çakır, 2017; Hsieh et al., 2017; listening, vocabulary and speaking (Hung, 2017). With this regard, Blake (2016) argues that L2

teaching with technologies carefully and appropriately undergirded by the TBLT theory will enable the L2 instructors or curriculum designers to integrate the four macro skills simultaneously. This study provides empirical evidence for the abovementioned claim. The employment of videos showing the native speakers of English and other e-learning sources shared through Schoology adheres to the principles of goal orientation and holism of the technology-mediated instruction as they offer the authentic, grammatical, and non(linguistic) or multimodal learning experiences for the students. These are adequately accommodated by the students through watching and discussing videos as well as doing grammatical exercises on the e-learning platform. In addition, the reflective practice principle is evident in that the students were noticing their classmates' presentations using the Freemind app and the journal reflection that they were required to write. Overall, the present study yields insightful evidence on the successful implementation of FCMT for the teaching and learning of essay in the post-earthquake EFL writing pedagogy on the Island of Lombok, Indonesia.

5. Conclusion

The Flipped Classroom model guided by the technology-mediated task principles provides promising pedagogical benefits. This study offers empirical evidence of such educational advantages, particularly with reference to learning essay writing in English. The implementation of FCMT in this study has been overall positively perceived compared to FTF-only classes by the students in that it facilitates their learning beyond the classroom and gives them more opportunities to learn and use English in and outside classroom, leading to necessary input; hence, improving their motivation and English skills, particularly writing. The five characteristics of Technology-mediated task: primary focus on meaning, goal orientation, learner centeredness, holism, and reflective learning, underlie the learning design. Both the task-based framework and FC are complementary inasmuch as the former maximizes the potential use of the technologies for language learning purposes, while the latter enhances the employment of the language learning theory (González-Lloret & Ortega, 2014), and, if carefully designed, the combination of the two may integrate the four macro skills (Blake, 2016). The nature of FC, where the students learn advanced concepts about writing through the Web 2.0 technology and do respective learning tasks or activities in the classroom FTF, adds another educational benefit or power to the technology-mediated task as the pedagogical framework for the teaching of L2 using technologies. On the other side of the coin, the principles of technology-mediated tasks guide the application of FC.

Despite contributing to the growing body of literature in the ELT context, this study highlights some important points for better future pedagogical application of FCMT. Practically speaking, future design of FCMT should be less cognitively demanding, particularly in such contexts in which this approach is new to students to avoid being overloaded with tasks. For the same token, Mehring (2018) suggests that learning using FC as a new learning approach should be gradually developed. The issue of copying someone else's work in online discussion forum as grumbled by one of the students in this study should be taken into account. Setting suitable time allotment for the quizzes can be an alternative for this issue, including setting the discussion forum where the students are unable to see their classmates' responses before they take part, especially when using Schoology learning platform.

English (writing) teachers or instructors should continually carry out reflective practices to address the aforementioned issues. Future studies may try to ground the learning design in Task-based methodology as developed by Skehan (1996) and Willis (1996), such as pre-, during, and post-task, with a less demanding task design.

Theoretically speaking, since the current study provides more specific contextual qualitative data, it lacks empirical evidence on the effect of the deployment of FCMT on the students' writing skills. Hence, experimental studies are of paramount importance, such as pure-experimental research, quasi-experimental design. Further, given the diverse contextual complexities, Design-Based Research (DBR) can be an alternative methodology for future studies to figure out the correlation between various contextual variables and generate practical theories for its implementation in similar or different pedagogical contexts. Nonetheless, the present study encapsulates the successful implementation of FC anchored in the technology-mediated task framework in the context of post-earthquake EFL writing pedagogy that offers theoretical and practical insights for English (writing) instructors and academics interested in the sphere.

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DEVELOPING LANGUAGE, CONTENT, AND DIGITAL COMPETENCE THROUGH INTERNATIONAL TELECOLLABORATIVE PROJECT WORK

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Abstract

Telecollaboration seems to be a present emerging practice in education. In this sense, telecollaboration is wide and covers several areas of work and study, and it can also concern hybrid ones. This research focuses on developing learners' digital competence, English language skills for professional purposes, and knowledge on recycling matters through a telecollaborative project work. The framework for this study is based on Spiers and Bartlett's (2012) model on developing language, content, and digital skills, and it also focuses on the taxonomy of communication acts in professional contexts introduced by Lehman and DuFrene (2013). Students had to work collaboratively in groups of four students, from two different institutions and countries, and create a blog on the topic of recycling matters, analyzing the current problems and offering possible solutions. Students were tested before and after the project in order to measure their progress within the different areas of study. Results showed that this telecollaborative project work was potentially beneficial; the experimental group performed better in all the areas tested after this project. In conclusion, it seems that telecollaboration projects helped develop the target skills in this research following an integrated learning approach.

Keywords: Language; Content; Digital Literacy; Telecollaboration; Project Work

1. Introduction

Virtual exchanges are learning opportunities that have appeared after breakthrough technological advances in the field of communication. This practice consists in promoting educational programs in which technology allows students and instructors, who are geographically distant, have virtual face-to-face encounters and exchanges to work on lessons and activities. This implies that the number of opportunities to work with people from other

countries has also increased considerably. Virtual exchanges also concern present global needs, and they promote professional skills such as digital competence, foreign language competence, or communication skills to work in different cultural contexts (Ferrari, 2012; Helm, 2015; Van Laar et al., 2017). In the field of languages, virtual exchange is a synonym of telecollaboration (Guth, Helm & O'Dowd, 2014), so it makes sense to use this term along this research. Virtual exchange is a broader term, and it is a hypernym of telecollaboration. Thus, telecollaboration is a suitable term in the field of foreign language learning because it focuses on the development of foreign language competence, intercultural communicative competence and digital competence (O'Dowd, 2018).

The benefits of telecollaboration in the field of foreign language learning have been reported in previous research. Bueno-Alastuey and Kleban (2016) compiled some of them in their research. The first advantage is that non-native speakers can speak with native ones, or with speakers whose first language is different, or who have a target language in common (O'Rourke, 2005; Bueno-Alastuey, 2010, 2013). These projects also promote meaning negotiation, a strategy that is conductive to second language acquisition (Ellis, 2003). In addition, telecollaboration can also help enhance acquisition of lexicon, grammar, and pronunciation features (Bueno-Alastuey, 2011; Guth & Marini-Maio, 2010). Similarly, Wylie (2010) found that students improved their writing skills in a telecollaborative project work based on email exchanges. As regards oral skills, it seems that virtual language exchanges help improve pronunciation (Bueno-Alastuey, 2010), speaking fluency (Tian & Wang, 2010), and raise confidence in using L2 (Polisca, 2011). Among other benefits, Jauregi and Bañados (2008) also found that telecollaboration can increase learners' motivation, whereas Cunningham and Vyatkina (2012) suggested that it can also help learners enhance their digital competence. Considering these previous results, it seems that this type of projects can be potentially beneficial for students' L2 acquisition.

This research focuses on the development of digital competence, enhancing English language skills for professional purposes, and gaining knowledge on recycling matters altogether through collaborative project work. The aim of this project was that students collaboratively created a blog on the topic of recycling. The participants in our experiment were engineering students from Universitat Politècnica de València (UPV) and Häme University of Applied Sciences (HAMK). The framework for this study is based on Spiers and Bartlett's (2012) model on developing language, content and digital skills. These researchers suggested that the development of learners' digital literacy does not only concern the users' knowledge and application of technology for specific purposes, but the students should also be able to

express themselves and communicate the actions conducted through the use of these tools. In this project, the target language is English for professional purposes, the content to be developed concerns the topic of recycling issues, and the digital tools are some free access ones provided by Google: Classroom, Blogger, Hangouts, Drive as well as Office tools. Through the use of these digital tools, students were expected to be able to develop some professional skills in a foreign language such as participating in meetings, negotiating, teamwork, or presenting information orally and in writing, among others. In conclusion, it was expected that through this project, students would develop the aforementioned skills collaboratively in a virtual environment, whose final aim is to create a blog on the topic of recycling.

2. Literature Review

2.1. Towards digital literacy

The evolution of technology has been brisking in the present century, and it has had noticeable effects in all areas of life. The way people work, communicate, get information, become entertained, socialize, exercise, or learn, among many others, has indisputably changed. Consequently, it seems conclusive that a great range of new technology resources have been integrated in our daily lives, and people need to know how to use them. The term 'digital literacy' implies that people need to be capable of using Information and Communication Technologies (ICT) such as computers and the Internet (Bowles, 2013; Gruszczynska, Merchant & Pountney, 2013; Summey, 2013).

To this aim, Spiers and Bartlett (2012) suggested a series of items that characterize a digitally-literate individual. Some of these characteristics are the ability to design, develop and apply digital tools for the creation of information, discovery and transfer of new knowledge, experimentation and data analysis and communication. To synthesize all these skills that are expected to be found in digitally-literate people, these authors grouped these skills into three categories: location and consumption of digital content, creation of digital content, and their communication. As can be seen in Figure 1, the triangular model of Spiers and Bartlett (2012) connects these three categories. The development of each of these skills entails working with the rest, and these are developed jointly. Thus, the digitally-literate people should not only be capable of knowing how to use a series of digital tools, but they should also be able to apply them in their field of work to develop their own content, communicate their use, actions and results correctly.
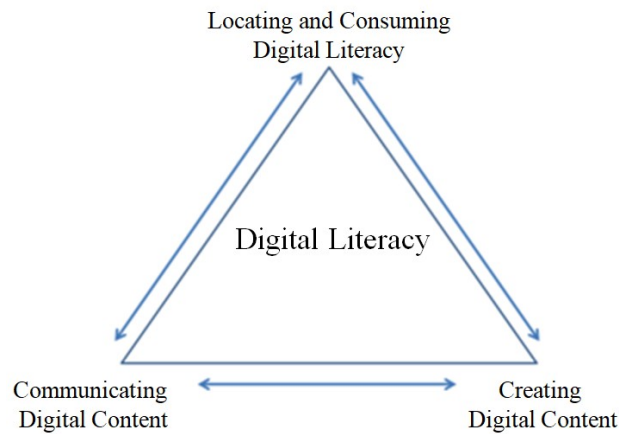
Figure 1. Development of digital literacy (Spires & Bartlett, 2012, p. 10)

2.2. Content and Language Integrated Learning and digital competence

We understand that the proposal of Spiers and Barlett (2012) is a suitable model to define the digitally-literate individual. In the same way, from the pedagogical perspective in language teaching, the same proposal can be outlined without modifying the structure proposed by these authors. The model suggested in Figure 2 focuses on Content and Language Integrated Learning in digital contexts. This proposal does not define the digital literacy, but it focuses on describing the language learning process through content in digital contexts. As a result, students will learn how to use digital tools with the aim of creating content in the digital format and using specific language forms to express themselves in each context. In other words, the aim of this proposal is to integrate different learning areas through telecollaborative work.
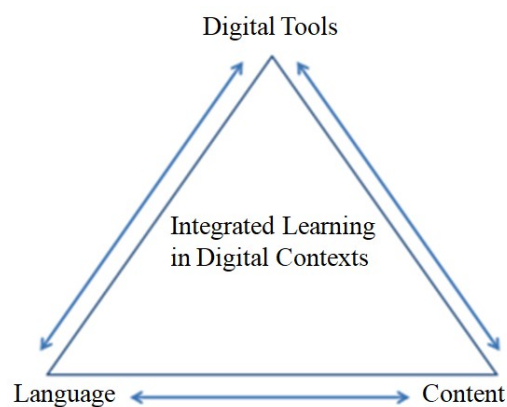
Figure 2. Integrated learning in digital contexts

The integration of content and language or the use of a vehicular language to teach content is a common practice among educators. One of these practices is known as the Content and Language Integrated Learning approach (CLIL), and it has been implemented in the classroom since Marsh (1994) first coined it. CLIL is a dual-focused educational approach which uses an additional language in the learning and teaching of content and language; these are united in the curriculum despite the fact that the emphasis is sometimes given to one or the other (Coyle, Hood & Marsh, 2010).

The roots of CLIL are set in the 1960's in Canada, where English and French were established as official languages. As a response to societal needs, immersion programs were used to help people to become competent in both languages. According to Lasagabaster and Sierra (2010) as well as Coyle (2006), those programs were successful and well-received among the population; years later, that model was adapted to the European context. Supporters of this methodology (Dalton-Puffer, 2010; Lasagabaster, 2008; Marsh, 2013, among others) suggest that learners increase their target language competence in CLIL more than in other methods without suffering significant restrictions to the contents of the non-linguistic subjects (e.g., biology, history, physical education, or maths).

Concerning language acquisition, it is necessary to refer to fluency and accuracy. Most students in CLIL are not masters of the language in their early stages; in fact, they do not achieve high levels of proficiency until the end of primary education or the beginning of the secondary level. Besides, the complexity of certain specific topics is not suitable for children due to a comprehensible lack of maturity (Eliassen, 2007). In this sense, CLIL focuses on the same contents included in the curriculum of monolingual programs, which are adapted to the age of the students. It is true, though, that students may find difficulties in communicating in a language different from their mother tongue, especially due to accuracy problems (de Zarobe, 2015). In these cases, teachers must consider and assess the information relevant to the topic being discussed. When teachers identify some complex difficulties related to the language use, they can give the necessary support like new grammar forms or vocabulary. In some schools, students receive support for content subjects through sessions related to language literacy (Lyster & Ballinger, 2011; Mehisto 2012).

Supporters of CLIL also suggest that language should not be a barrier. However, some students may feel frustrated when they suffer communication restrictions. If language support is not effective, the problem could be rooted in their motivation. Murphey and Dörnyei (2003) suggest some strategies for motivation; but, above all, teachers should motivate students with attractive resources and materials of their interest as well as show them how relevant and useful

the target language is for their daily life and future. Motivation in the 21st century is different from the one in the past; nowadays, students are considered digital natives and they are very familiar with ICT resources (Calvo-Ferrer & Belda-Medina, 2015). Thus, it is common sense that teachers should integrate technology during their classes to increase learners' motivation as this is part of their daily lives.

In this context, it could be understood that it is possible to combine language, content, and digital tools through telecollaborative project work, as it is suggested in our model of integrated learning in digital contexts based on Spires and Bartlett (2012) (see Figure 2). Therefore, content is taught through language; and language is communication (Chomsky, 1980). Lehman and DuFrene (2013) suggest that communication is a process by which information and meaning is exchanged among individuals through symbols, signs, and behaviour. In addition to this, communication includes expressing feelings, conversing, corresponding, writing, listening, and exchanging information. However, language is wide in the sense that it covers all the possible communication acts in several different contexts. From a pedagogical perspective, it is near impossible to cover all the communication acts within the same curriculum. Therefore, this project focuses on some communication acts in professional contexts. To determine the most common communication acts in professional context, this research adopts the taxonomy introduced by Lehman and DuFrene (2013, p. 2). Based on previous studies, these authors suggested that managers spend between 60% and 80% of their time involved in communication, and the most usual communication acts that they are engaged in are as shown in Table 1.

Table 1. Most usual professional communication acts (Lehman & DuFrene, 2013, p.2).

1.	Attending meetings
2.	Writing reports
3.	Presenting information
4.	Explaining and clarifying procedures to other colleagues
5.	Working in group
6.	Evaluating and counselling other people and their work
7.	Promoting your product or service / Persuading others

2.3. Telecollaborative project work

As previously pointed out, the integration of ICT in the classroom is highly advisable since students are digital natives who are already used to it. In addition, globalization is leading to new labour environments in which communication is online. Thus, telecollaboration projects could be a useful resource to integrate language, content, and ICT. Belz (2003, p. 68) explained

that telecollaboration projects involve "the use of Internet communication tools by internationally dispersed students of language in institutionalized settings in order to promote the development of a foreign language linguistic competence and intercultural competence". Later, Sadler and Dooly (2016, p. 402) defined telecollaboration in education as "an embedded, dialogic process that supports geographically distanced collaborative work through social interaction, involving a/synchronous communication technology so that participants co-produce mutual objective(s) and share knowledge-building". From a language teaching perspective, Dooly (2017, p. 170) states that telecollaboration studies are more abundant in the fields related to language teaching and learning than in other disciplines since they are easily combined with other non-language disciplines, which connects with the principles of CLIL previously introduced in this section.

The completion of this triangle (language, content, and digital skills) requires a task or a project. In this case, the principles of project work should be considered. As explained by Thomas (2000), project work is an approach in which projects are central to the learning process. In the field of language teaching, the learning process involves a series of communicative tasks directly connected to the curricular objectives and aims (Oura, 2001). Project-based learning concerns interrelated tasks which involve learners in designing processes, problem-solving, decision making, or doing research (Korfhage-Smith, 2010). This implies that project-based learning focuses on constructivism; Dudley-Evans and St. John (1998) underline that tasks and projects promote learning in a constructivist-communicative environment in real-life situations, in which students are engaged in tasks. Besides, it promotes students' autonomy and cooperation that culminates in the creation of real products (Istanto, 2013). In addition, as suggested by O'Dowd and O'Rourke (2019, p. 1), this type of projects require that the role of the teacher in project-based learning is a facilitator "with the aim of developing learners' foreign language skills, digital literacy, and intercultural competence".

At last, some previous research within the field of telecollaboration explored different areas, objectives, and profiles, which can include the effects of technology (Helm & Guth, 2010; Lewis & O'Dowd, 2016; Dooly, 2017; Dooly & Sadler, 2013; Guth, & Thomas, 2012), challenges and difficulties of telecollaboration for language teaching (Pérez-Cañado, 2012; Dooly, 2008; Guth & Helm, 2012; Helm & Guth, 2016; O'Dowd, 2007; Tudini, 2010), the exploitation of the social dimension (Belz, 2002), the development of intercultural competence (Belz, 2003; Çiftçi & Savaş, 2018), or the development of digital literacy (Helm, 2014; Spiers & Bartlett, 2012).

In sum, this literature review illustrates different characteristics of telecollaborative foreign language learning and teaching by following the work of other previous authors. In the present scenario, telecollaborative project work seems to be more necessary than ever, and it is an advantageous approach adapted to the contemporary teaching and learning needs. The framework for this study is mainly based on the model suggested by Spiers and Bartlett (2012), which describes the main characteristics of digital individuals regarding their language, content, and digital skills. In this sense, this model has been adapted to the context of foreign language teaching and has assessed the progress of a group of students on the target skills after the completion of a project work. Thus, the main research gap that this paper attempts to address is the implementation of the model suggested by Spiers and Bartlett (2012) through telecollaborative project work, in which language focuses on the communication acts in professional contexts suggested by Lehman and DuFrene (2013), the content knowledge is recycling, and the digital tools used are some Google apps.

3. Methodology

3.1. Aims and hypothesis

The objective of this collaborative project was to help students develop their communicative competence in English for professional purposes and their thinking on the issues of recycling, recovery, and reprocessing of materials in an international professional context, as well as enhance their digital competence. Our hypothesis is that the implementation of a telecollaborative project with students from different universities and countries, whose mother tongue is different, would help them enhance their foreign language competence (English) and digital skills (Google Apps). Figure 3 shows the practical application of our model of integrated teaching in digital contexts based on the model of Spires and Bartlett (2012).
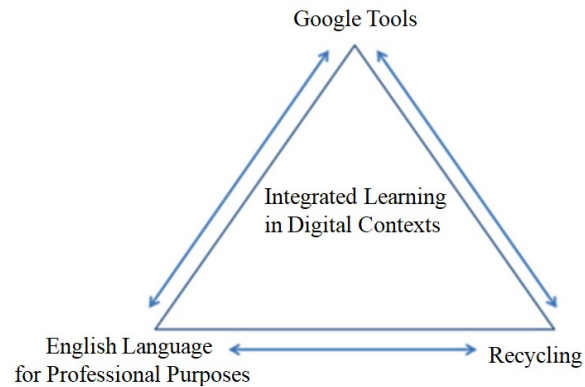
Figure 3. Proposed model for integrated learning in digital contexts

3.2. Participants and instruments

There were 69 participants who completed the project successfully; the experimental group had 35 and the control group 34. These participants were engineering students from UPV and HAMK, aged 19-24, who had been enrolled in a subject of English, B2 level. Initially, there were more participants in both groups but not all of them completed the necessary tests to measure their progress and were not considered in this research.

The instruments used in this project were some Google applications: *Classroom, Hangouts, Blogger, Drive,* and *Docs*. *Classroom* was used by the teacher to communicate with the students, post information, give instructions, and share resources for the development of the project. The students used *Hangouts* for their videoconferences and chat. In order to record their videoconferences, different software was used, although *OBS Studio* had been recommended. Next, *Blogger* was the tool used to jointly create and publish blogs. Finally, *Drive* was used as the shared space for group members and teachers, where students uploaded the material and files, such as videos, pictures, or documents (*Docs*).

3.3. Design and procedure

As previously said, our participants were enrolled in an English language subject (6 ECTS). Both the experimental and control group followed the same work plan in 4.5 ECTS, whereas the remaining 1.5 ECTS were different. While the control group attended all the regular English language practical sessions, the experimental group spent this time working in a telecollaborative project. We estimated that the approximate workload of this project was equivalent to 1.5 ECTS of the English language subject. In any case, the participants of each

group could only follow one of the two itineraries, thus guaranteeing that the studying time was the same for both groups.

The research was conducted from September to December 2019 and was divided into 4 stages. The first stage was the creation of groups, which were formed by 2 students from HAMK and 2 from UPV. In total, there were 12 groups; 10 groups had 4 members and the other 2 were formed by 3 students, 2 UPV students and 1 HAMK student. The second stage was for instruction; both the experimental and the control groups received a 2-hour content training session, which included specific language related to recycling issues. After this session, the course continued with the usual English language lessons concerning both general and specific language.

The third stage marked the beginning of the group work. The students had to collaboratively create a blog which examined the current situation of recycling issues and their potential problems and were supposed to offer solutions to them. To complete this task, our students were to post at least 4 entries in their blogs, including two written ones and two videos. Their group decisions was to be taken in video-conferencing meetings, and they needed to hold at least 3 during this stage, write a report for each, record them in video, and share them with the instructors in a shared folder. Their blogs had to be finished by October 31st.

Finally, the last stage of this project was its evaluation. Firstly, the groups had to discuss and assess the blog of another group in a meeting. After this, they held a new meeting with the members of the group whose blog had been previously assessed. The aim of this meeting was to offer some guidance on how to improve their blog. The items of their assessment were the blog's content, originality, language, and quality. The maximum mark was 2 points out of 10, and the value of each item was 0.5 points. After this meeting with the members of another group, they had one week to enhance their blogs based on the guidance received. Secondly, students were supposed to show their blog in a public online presentation to the professors of both institutions. The value of this presentation was 5 points out of 10, and the items assessed were also the same: content, originality, language, and quality. At last, the remaining 3 points were awarded according to the degree of compliance with the instructions of the project: holding the meetings and uploading their respective videos and reports.

3.4. Data collection and analysis

Regarding the data collection for this research, these were gained through the tests that the students completed during the term, after which the experimental and the control groups were compared. The main purpose of this project was to measure the overall progress of the students'

knowledge and competence on language (English for Professional Purposes), content (Recycling), and digital tools (*Google Apps*). In order to measure the participants' communicative competence in their professional language, the students took a language test based on the content of the book *Communication across Cultures* (Dignen, 2011) at the end of the term. The content of this test was based on the professional communication acts proposed by Lehman and Dufrene (2013). In addition, the students also participated in a survey in which they graded the degree of importance of these professional language skills in their lives and to what extent they thought they had developed them. Regarding content, another self-created test based on the content seen in the training session was designed to check students' knowledge of recycling issues. At last, the progress in their digital competence was based on another survey which focused on their knowledge and skills in the use of *Google* tools. Table 2 shows the target professional language skills, the tasks to enhance them, and the digital tools to complete the task.

Table 2. Development of communicative competence in professional contexts through telecollaboration

Professional Communnicative Acts	Tasks	Digital Tools
1. Attending meetings	6 online meetings	*Hangouts*
2. Writing reports	4 written reports on the online meetings	*Docs*
3. Presenting information	2 oral and 2 written entries in a blog	*Blogger, Docs, Videos*
4. Explaining and clarifying procedures	Online meetings and previous and post written contact: email and chat	*Hangouts, Gmail*
5. Working in group	Online meetings, previous and post written contact: email and chat, and collaborative shared work.	*Drive, Hangouts, Docs, Gmail*
6. Evaluating and counseling	1 online meeting with another group	*Hangouts*
7. Promoting your product or service / Persuading others	1 online meeting with another professor	*Hangouts*

4. Results and findings

Students took two tests to determine their knowledge of recycling issues and competence in English for professional purposes. In both cases, results show that the experimental group performed better than the control one. Concerning content, the experimental group scored a mean mark of 8.37 out of 10 possible points, whereas the control group scored 7.06. This implies a difference of 1.31 points, or a percentage variation of 18.56%. The case of language was even more significant; the experimental group obtained a mean mark of 7.65 out of 10 and the control group scored 5.12. The difference is 2.53 and in terms of percentage variation is 49.41% (see Table 3).

Table 3. Students' performance on language and content tests

Tests	Experimental	Control	Difference	Variation %
Content: Recycling	8.37	7.06	+1.31	+18.56%
Language: Professional English	7.65	5.12	+2.53	+49.41%

At the end of the project, students were also asked how important they felt the following situations were in their professional lives. Table 4 shows results of these needs analyses. As it can be observed, both groups consider that these professional skills are important in their professional lives. The experimental group viewed them more important than the control one after they had to manage situations that involved a certain degree of competence in the following professional contexts. It shall be noticed that none of these skills was graded below 3.82.

Table 4. Needs analysis: importance of professional skills

Professional Skills	Exp.	Cont.	Diff.	V. %
Attending meetings	4.68	4.15	+0.53	+12.77%
Writing reports	4.59	3.82	+0.77	+20.16%
Presenting information	4.76	4.24	+0.52	+12.26%
Explaining and clarifying procedures to other colleagues	4.57	4.24	+0.33	+7.78%
Working in group	4.65	4.29	+0.36	+8.39%
Evaluating and counseling other people and their work	4.35	3.87	+0.48	+12.40%
Promoting your product or service / Persuading others	4.27	4.13	+0.14	+3.39%
Mean	4.52	4.15	+0.37	+8.84%

The following table shows the degree of confidence of students when participating in the target professional acts. As it can be observed in Table 5, both the experimental and the control groups had similar degrees of confidence when participating in the target professional acts before the experiment. It was after the experiment when the difference between the two groups was more significant. The results shown in the following table suggest that students who participated in the telecollaborative project felt that they had enhanced their confidence to participate in the target professional acts a great deal.

Table 5. Development of professional skills

Degree of confidence	Experimental Group				Control Group	
	Before	After	Diff.	% V.	Survey	% V.
1- Attending to and participating in meetings	3.05	4.24	+1.19	+39.02%	3.19	+32.92%
2- Writing professional reports	3.14	3.86	+0.72	+22.93%	3.11	+24.12%
3- Presenting oral and written information	2.92	3.81	+0.89	+30.48%	3.10	+22.90%
4- Explaining and clarifying procedures	3.38	3.92	+0.54	+15.98%	3.63	+7.99%
5- Team work	3.84	4.16	+0.32	+8.33%	3.98	+4.52%
6- Evaluating and counseling other people	3.35	3.84	+0.49	+14.63%	3.42	+12.28%
7- Promoting your product or service/persuasion	3.03	3.65	+0.62	+20.46%	3.29	+10.94%
Mean	3.30	3.88	+0.57	+17.98%	3.48	+11.73%

A similar situation happened with the use of Google tools; the initial degree of digital competence of the participants in the project was similar to the control group. It was also after the completion of this project when the difference between the experimental and the control groups was more noticeable. The test enquired students how skillful they felt on the use of the *Google* tools. Table 6 shows that the mean progress of the students on their use and application of these tools was 0.91, considering this a progress of 30.22% over the average initial value. In addition, it can be observed that the greatest progress was in the use of *Google Blogger* (74.11%), which, according to the data, was the least known tool at the beginning of the project.

Table 6. Development of digital skills (Google Tools)

Level of Expertise	Experimental Group				Control Group	
	Before	After	Diff.	% V.	Survey	% V.
Google Blogger	1.97	3.43	+1.46	+74.11%	2.4	+42.92%
Google Docs	3.62	4.11	+0.49	+13.54%	3.52	+16.76%
Google Drive	3.89	4.3	+0.41	+10.54%	3.85	+11.69%
Google Hangouts/Skype	3.16	4.22	+1.06	+33.54%	3.34	+26.35%
Google Classroom (as a student)	2.35	3.46	+1.11	+47.23%	2.71	+27.68%
Mean	*3.00*	*3.90*	*+0.91*	*+30.22%*	*3.16%*	*+25.08%*

At last, the participants were asked about their perceived learning and satisfaction with this project. Table 7 shows that they strongly feel that digital skills are necessary in their current professional lives. In addition, the students responded to a series of questions on their degree of learning in different areas. The mean of agreement with these 7 statements related to learning different skills was 4.09. Besides, we added questions related to operating in a multicultural environment and problem-solving skills; results showed that they were also satisfied in this sense. At last, it seems that their satisfaction with this project was also high (4.19 out of 5).

Table 7. Project satisfaction

	Exp.	Cont.
Digital skills are necessary in the current professional world.	4.78	4.42
Working in this project improved my digital/IT skills.	4.05	*Not applicable*
Working in this project improved my language on professional issues.	3.97	
Working in this project improved my language on recycling issues.	4.22	
Working in this project improved my professional skills in digital contexts (meeting, presenting information, writing reports…).	4.19	
Working in this project improved my knowledge on recycling issues.	3.95	
Working in this project helped me operate in a multicultural environment.	4.22	
Working in this project improved my problem-solving skills.	4	
I feel that the skills acquired in the project will be useful for me in working life.	4.49	
I am very satisfied with this project.	4.19	

4. Discussion

Based on Spiers and Barlett (2012), this research has suggested a model of integrated learning in digital contexts, which focuses on the development of three elements through a telecollaborative project in a cohesive way: language, content, and digital skills. In this case, the first objective was to help learners improve their English language skills for professional purposes, following Lehman and Dufrene's taxonomy (2013) of the most usual managers' professional communication acts. The second was to contribute to improve students' knowledge of recycling matters. The third one aimed at helping learners enhance their competence on the use of some *Google* tools. These three areas were integrated in a telecollaborative project work which primarily consisted in the creation of a blog and its presentation in public.

The results obtained suggest that the students' participation in this telecollaborative project was beneficial for different reasons. Firstly, participants in this project scored higher in the language test than the control group: +49.41%. It seems that our participants had the opportunity, and also the need, to use the target language in a real context in order to fulfill the goal of a specific task. The participants needed to hold meetings, carry out continuous negotiations, work in teams, or present information orally and in writing through a blog. Consequently, the project participants also had a higher degree of confidence when participating in the professional communicative acts suggested by Lehman and Dufrene (2013): +11.73%.

Secondly, the participants gained more knowledge of recycling in comparison to the control group: +18.56%. In this case, both groups attended a 2-hour session which focused on recycling matters. In this case, the experimental group continued using this knowledge during the completion of the project, whereas the control group was not offered new opportunities to apply this knowledge in practice. At last, when comparing the knowledge of both experimental and control group before launching the experiment with the knowledge of the experimental group after the project, the results showed that the experimental group advanced noticeably in this area: +25.08%.

It seems that the integration of content, language, and digital tools in a telecollaborative project had satisfactory results because it engaged students in a real constructivist environment in which communication was based on real facts and the creation of content, as it happens in CLIL or CBI. In addition, the use of digital tools for a specific aim helps the students learn how to use them and communicate their findings. Thus, the triangle introduced by Spiers and Bartlett (2012) seems to help individuals become digitally literate, being capable of creating

digital content while consuming it, and communicating at the same time. As they suggested, the digitally-literate people should be able to apply digital tools in their area of work to develop their own content, and communicate their use, actions, and findings. In this sense, one of the reasons that could explain why the experimental group performed better than the control group was that the participants were involved in a collaborative action in which the target language and its specific forms needed to be used as a working tool for the creation of a blog.

As Dudley-Evans and St. John (1998) suggest, task-based learning promotes constructivist learning in a communicative context. Thus, the creation of a blog implied that our students needed to do research and work together in the development of the blog content, as well as negotiating and problem-solving, and through a real communicative process in English, which was the only common language among the members of each group. These results are also in concordance with the words of Korfhage-Smith (2010), who suggested a series of benefits through tasks and project work if the teaching of content and languages was combined, in our case through digital tools in professional environments.

At last, other competences that seemed to have been enhanced are autonomy, teamwork, decision-making, or problem-solving, among others. These skills are also connected to the teacher's role as a facilitator, as recommended by O'Dowd and O'Rourke (2019). The need to work in teams and collaboratively negotiate the actions to take seems to be fundamental for enhancing learners' language, content, and digital skills.

5. Conclusion

This research has introduced a practical case of telecollaboration experience based on project work which integrates language, content, and digital tools. This experiment could be considered an example and a way of encouragement for future educators who are willing to implement practices likes this one in the foreign language classroom. As it has been stressed above, the results of this experiment are satisfactory since the experimental group scored higher than the controlled group in all the tests (language, content, and digital skills), and our participants also acknowledged their satisfaction with their participation in this project. The students also agreed that digital skills are necessary in the current professional world and their learning through this project had helped them enhance their professional language and digital competences.

In sum, the main limitation in this research is that language and content were not tested before the experiment and these data would have been useful in assessing the students' progress, both of experimental and control groups. In addition, the assessment of content would be more reliable in a subject in which the CLIL approach is applied; in our case, content related

to recycling was introduced to all the students, but only the experimental group had the opportunity to continue using it along the term. In further research, these limitations could be avoided. We suggest that compiling data from a larger group would be desirable, and other aspects could be analyzed such as the development of intercultural competence, other communicative acts, or other digital tools. Extending the length of the project would also be useful as it would help analyze the development of language skills. All in all, we consider that the satisfaction of our students and the results obtained are acceptable and conclusive.

In conclusion, this research is another example of telecollaborative work, as the ones cited in our theoretical framework. Based on our experience, we could conclude that this teaching proposal based on the integration of language, content, and digital skills through telecollaborative project work has been beneficial to the students, and we highly recommend the implementation of this kind of projects in the foreign language classroom.

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PROSPECTIVE PRIMARY SCHOOL EFL TEACHERS' BELIEFS ABOUT "FLIPPING"

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Abstract

Our paper focuses on the implementation of the flipped classroom model with the students of the subject ICT for EFL teaching and learning at a Spanish university. This pedagogical approach, generally speaking, reverses the traditional learning environment by delivering instructional content outside the classroom and working on it in class. The ultimate goal of our research is to evaluate the aforementioned model, used with a sample of 40 students, through a mixed-method approach. To this aim, a satisfaction survey (Gilboy, Heinerichs & Pazzaglia, 2015) plus two open-ended questions were administered to participants in the study. The results obtained, through both quantitative and qualitative techniques, reveal that the majority of the students completing the evaluation preferred the flipped method compared with the traditional one.

Keywords: English as a foreign language (EFL); flipped classroom (FC); flipped learning (FL); higher education; students' perceptions

1. Introduction

In tune with the new European Space of Higher Education (ESHE), as reported in Domínguez et al. (2017, p. 2), there has been a substantial change in education, which has started embracing innovative didactic proposals such as peer instruction (Mazur, 1996; Crouch & Mazur, 2001), first-exposure learning (Walvoord & Johnson, 1998), just-in-time teaching (Novak, Patterson, Gavrin & Christian, 1999; Novak, 2011) or the inverted classroom (Lage, Platt & Treglia, 2000). All these innovative didactic proposals, together with the influence of the Khan Academy (2006), are going to develop into the so-called *Flipped Learning Approach*, a new learning-centred pedagogical model, as opposed to the traditional teaching-centred approach (Rué, 2007), which emphasizes student preparation before class (Hung, 2015).

According to the definition offered by the Flipped Learning Network (FLN)[1],

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[1] The Flipped Learning Network has the mission of providing educators with the knowledge, skills, and resources to implement Flipped Learning successfully. (see https://flippedlearning.org/wp-content/uploads/2016/07/FLIP_handout_FNL_Web.pdf).

> Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter. (Flipped Learning Network, 2014, p.1)

However, we should have in mind, as claimed by the key leaders of the FLN, that flipping a class does not necessarily lead to FL. To engage in *real* FL teachers must incorporate four pillars into their practice (Flipped Learning Network, 2014, p.2):

- *Flexible environment*, with flexible spaces in which students choose when and where they learn.
- *Learning culture*, with in-class time dedicated to exploring topics in greater depth and creating rich learning opportunities.
- *Intentional content*, with FL educators continually thinking about how they can use the Flipped Learning model to help students develop conceptual understanding, as well as procedural fluency.
- *Professional educators*, continually observing their students, providing them with feedback relevant in the moment, and assessing their work; reflective in their practice, connecting with each other to improve their instruction, accepting constructive criticism, and tolerating controlled chaos in their classrooms.

Nwosisi, Ferreira, Rosenberg and Walsh (2016) define flipped instruction or a FC as "a form of blended learning in which students learn new content online by watching video lectures, usually at home, and what used to be homework (assigned problems) is now done in class with teachers offering more personalized guidance and interaction with students, instead of lecturing. This is also known as backwards classroom, flipped classroom, reverse teaching, and the Thayer Method". (p.348)

Santiago and Díez, coordinators of "The FC Project", argue that the FC model is a pedagogical model that transfers specific learning processes to outside the classroom and uses classroom time, together with the teacher's expertise, to facilitate and promote other knowledge acquisition and knowledge practice processes inside the classroom (https://www.theflippedclassroom.es/what-is-innovacion-educativa/). Focusing on the genesis of the model, in the same way that a FC is known by different names (inverted, reverse, upside-down classroom), stories about its origins also differ; though most credit high school Chemistry teachers Jonathan Bergmann and Aaron Sams as the creators of this pedagogical approach (Arnold-Garza, 2014). Bergmann (2011) expressed on the web his idea of where the FC came from as follows:

> In the spring of 2007 Aaron was thumbing through a technology magazine and showed me an article about some software that would record a PowerPoint slideshow including voice and any

annotations, and then it converted the recording into a video file that could be easily distributed online. As we discussed the potential of such software, we realized this might be a way for our students who missed class to not miss out on learning. Thus, we began to record our live lessons using screen capture software. We posted our lectures online so our students could access them. When we did this, YouTube was just getting started and the world of online video was just in its infancy (…). Our absent students loved the recorded lectures. Students who missed class were able to learn what they missed. Some students who were in class and heard the live lecture began to re-watch the videos. Some would watch them when reviewing for exams. (pp.1-2).

Ouda and Ahmed (2016, p. 425), after reading The Flipped Class Manifest by Bennett, Bergmann, Cockrum, Fisch, Musallam, Overmyer, Sams, and Spencer (2012), sum up the common characteristics of flipped classrooms:

✓ Dynamic, active, and deliberate transfer of certain selected parts of the information delivery to outside of the classroom with the intention of freeing up time to take advantage of the face-to-face interaction in school. This is frequently done with teacher-created online videos (also referred to as screencasts or vodcasts).

✔ Educators turn out to be guides to understanding instead of distributors of facts and students come to be active learners instead of repositories of information. Making a long-lasting archived and documented tutorial of class content. Advanced students may never watch the videos again. All students can re-watch the video as much as needed. This frees more class time for data collection, active collaboration, and application.

✔ Learners have instant and straightforward access to any subject matter when they have need of, leaving the teacher with more opportunities to expand on higher order thinking skills and enrichment.

According to Taylor (2015), there are a number of advantages for both students and teachers when using the FC model. These, in particular, include better student engagement and greater flexibility of learning. However, there are also disadvantages, including student's lack of motivation to participate, technological issues (general technological issues and instructor issues), excessive time to create material, and lack of instructor contact.

Students in the FC are given more opportunities to develop higher-order thinking skills under teacher guidance and with peer support as needed because in-class lectures that often require only lower levels of thinking skills in Bloom's taxonomy (1984) are replaced with instructional videos (Hung, 2015).

Even though some studies have suggested no significant differences between flipped and non-flipped models regarding academic outcomes (Adnan, 2017; Guidry, Cubillos & Pusecker, 2013; as cited in Haghighi, Jafarigohar, Khoshsima & Vahdany, 2019), other studies (Hsieh, Wu & Marek, 2017; Day & Foley, 2006; Flumerfelt & Green, 2013; Haghighi,

Jafarigohar, Khoshsima & Vahdany, 2019; Hung, 2015, 2017a, 2017b; Lee & Wallace, 2018; Nguyen, 2018) suggest that flipped learning can make students more motivated and help them obtain better learning results. However, the need for further research into Flipped Learning in higher education and specifically into students' perceptions towards its use, is supported by some researchers (Basal, 2015; Cilliers & Pylman, 2019; Gilboy et al., 2015; Nouri, 2016).

To fill that gap, the present study sets out to flip the classroom for students of the subject called 'ICT for EFL teaching and learning', to examine the students' perceptions towards their learning experience. To this aim, a video-tutorial was created by the teacher and uploaded into the university's learning management system (LMS).

The research questions we address in this study are as follows:

RQ1: What are the students' perceptions of the use of video lectures?

RQ2: What are the students' perceptions of active learning inside the classroom?

RQ3: What are the students' perceptions of not having a teacher present during the virtual online class?

RQ4: What are the students' perceptions of the advantages of FL?

RQ5: What are the students' perceptions of the disadvantages of FL?

2. Methodology

2.1. Research design

Quantitative research establishes statistically significant conclusions about a population by studying a representative sample of the population (Creswell, 2003; as cited in Lowhorn, 2007, p. 1), and is based on the measurement of quantity. In contrast, qualitative research is non-numerical and has a discovery-oriented and holistic goal (Forman, Creswell, Damschroder, Kowalski & Krein, 2008, p.765). Creswell (2015, as cited in Doyle, Brady & Byrne, 2016, p.3) suggests that mixed-methods research is an approach in which the researcher collects, analyses, and interprets both quantitative and qualitative data, integrates the two approaches in various ways, and frames the study within a specific design.

The present study involved a mixed-methods approach, quantitative (a 5-item survey, RQ: 1-3) and qualitative (2 open-ended questions, RQ: 4-5), to evaluate the impact of FL on the participants. The main reason for selecting this approach is that it provides a more comprehensive account of phenomena under study (see Doyle et al., 2016).

2.2. Participants

The participants in the study (N=40) were prospective primary school EFL teachers taking ICT for EFL teaching and learning at a Spanish university, with no previous FC experience. Students enrolled in this subject met weekly for two class periods (a 90-minute and a 120-minute class period) in a multimedia lab, where each of them had access to a desktop computer. All participants were in the third year of the Primary Education Degree (foreign languages specialisation), with an average age of 20-23.

In selecting the sample, purposeful sampling was used (Creswell, 2013), with participants being judged to be adequate sources of information needed to answer the research questions.

2.3. Procedure

To control for expectancy effects, we ensured that participants were not informed of the specific purposes of the study, and when we were about to explain the potential benefits of authoring tools for creating educational resources, students were asked, as homework, to watch a video about the use of Hot Potatoes (http://hotpot.uvic.ca), a simple software freeware package that allows you to create on-line exercises in five different formats. The video had been previously recorded and uploaded by the teacher into the university's LMS. They were given a week to watch the video and try to understand how the tool works, the way to create the five types of exercises, and how to add different elements, such as images, videos, or sound files. During the following two weeks, students were engaged in hands-on in-class activities related to what they had learned from the video, with the teacher freed up for additional one-on-one time. They were encouraged to learn from and to collaborate with one another. In the fourth week, all the participants were asked to fill out a learning experience questionnaire that had been previously uploaded into the LMS.

2.4. Data collection and analysis

In order to achieve the aims of the research, we implemented the survey used by Gilboy et al. (2015) in their study to assess the students' perceptions of the FC learning environment. According to its authors, the survey had been approved by the Human Subjects Committee of West Chester University and constructed by the faculty associate who had experience in pedagogy related to this approach and led the campus-wide initiative on the FC. Cronbach alpha for the 5 Likert-scale items had also been performed and had revealed a value of .71, an acceptable value for reliability (Gilboy et al., 2015, p. 112).

The students were asked to rate the survey items using a 5-point Likert scale (Strongly Agree = 1, Agree = 2, Neutral = 3, Disagree = 4, Strongly Disagree = 5).

Table 1. Students' perceptions of FC before and during class

Survey Items*	Total n* (%)	1 n (%)	2 n (%)	3 n (%)	4 n (%)	5 n (%)
I liked the ability to watch the video rather than having straight lecture for this topic.	40 (100)	20 (50)	14 (35)	6 (15)	0 (0)	0 (0)
I would rather have the professor lecture for 2 class periods than complete the activities that were carried out.	40 (100)	2 (5)	2 (5)	10 (25)	14 (35)	12 (30)
The use of screen casting (videos) the lecture enabled me to learn the material more effectively than lecture alone.	40 (100)	14 (35)	20 (50)	6 (15)	0 (0)	0 (0)
I learned how to use the material with these teaching methods (screen cast of lectures and active learning in class) of instruction more than I did when we used traditional methods (lecture only) of instruction.	40 (100)	16 (40)	14 (35)	10 (25)	0 (0)	0 (0)
I felt disconnected without a teacher being present during the virtual online class.	39 (97.5)	2 (5)	0 (0)	8 (20)	17 (42.5)	12 (30)

*Overall n=40; not all respondents answered every question

*Strongly agree: 1; Agree: 2; Neutral: 3; Disagree: 4; Strongly disagree: 5

We added 2 open-ended questions, to elicit students' opinions about the advantages and disadvantages of the FC:

Q1: Advantages of the FC model

Q2: Disadvantages of the FC model

Data obtained from the open-ended questions were analyzed via content analysis method (Bauer, 2000) and similar ideas were grouped under proper headings.

The survey was anonymous in order to provide sincere and honest responses.

3. Results

Table 1 shows the students' level of agreement and disagreement on the key items from the survey. 85% of the students preferred watching the video lecture to F2F (face-to-face) lecture. The majority of students (65%) would rather complete the in-class activities for 2 class periods

than listen to the professor lecture for the same amount of time. 85% of students considered that they learned the material more effectively by watching the video lecture rather than F2F lecture. 75% of the students stated that they learned how to use the material more effectively with the video lecture and active learning, compared with lecture only. The majority of the students (72.5%) did not feel disconnected to the teacher during the virtual online class.

The qualitative data of the open-ended questions showed some important strengths of the FC approach. Students liked the ability to work at their own pace. They liked the possibility of working when and wherever they want. They spoke about learner autonomy, more interaction with peers and teacher, and more in-class time to solve questions.

On the other hand, concerns raised by students included not having the professor available to ask questions during the out-of-class sessions (lack of instant feedback). Participants in the study also mentioned the need for an internet connection and the technology required. They wrote about the students' responsibility for their own work and pointed out that it is easier for them to get frustrated. Furthermore, according to most of them, the teacher cannot see the problems students face. Regarding the teacher's role, they suggested that the teacher has to have a certain level of computer literacy and they put special emphasis on the more teacher working hours.

4. Discussion

The main objective of our study has been to analyse the learners' perceptions of the FC approach. The findings of this work support much of the research conducted in this sense, that most learners are more satisfied with learning in a FC as opposed to a traditional one (Adnan, 2017; Alsowat, 2016; Arráez, Lorenzo, Gómez, & Lorenzo, 2018; Frydenberg, 2013; Gilboy et al., 2015; Hung, 2015; McGivney-Burelle & Xue, 2013; Mok, 2014; Opazo, Acuña, & Rojas, 2016). Notwithstanding, there are also some studies that show a preference for the traditional method (Chung & Chi, 2017; DeSantis, Van Curen, Putsch, & Metzger, 2015; Strayer, 2012).

In our study, results were similar to those obtained by Gilboy et al. (2015), with students showing a total preference for participation in the in-class activities rather than listen to the teacher lecture. The participants reported that they learned the material more effectively with the use of videos as compared to the lecture alone, and also that they learned how to use the material with screen cast of lectures and active learning in class more than they did when they used lecture only.

The ability to work at one's own pace, the possibility of working whenever and wherever one wants, and the learner autonomy were some of the advantages perceived by

students. The fact that the course materials are online provides a high level of control over the pace of instruction, allowing learners to re-wind, pause, or speed up lectures whenever and wherever they want. Students can also preview and review the content, as many times as they want to, based on their needs and at their own pace (Hung, 2015). In addition to the aforesaid aspects, more interaction with peers and teacher, and more in-class time to solve questions (Basal, 2015) were also mentioned by participants as important benefits of the FL model.

Nevertheless, students reported that it is easier for them to get frustrated, as they become responsible for their own work (Strayer, 2012). The lack of instructor contact (Taylor, 2015), the lack of instant feedback in the out-of-class sessions, and the need for an internet connection and the technology required were also regarded as disadvantageous factors (Gündüz & Akkoyunlu 2019; Ramírez, Hinojosa, & Rodríguez, 2014). Besides, as prospective EFL teachers, their concerns also include the need for a certain level of computer literacy on the teacher's part and more teacher working hours (Lo & Hew, 2017; Taylor, 2015).

The results also lead us to conclude that teachers should be aware of the crucial importance of their role for the successful development of the FL process (Andujar, Salaberri-Ramiro, & Martínez, 2020). The role of the teacher has now changed to that of a guide, facilitator, and organizer; and teachers should be able to plan in detail what to do both inside and outside the classroom as well as promote student engagement (Basal, 2015). We agree with Fisher, Ross, LaFerriere and Maritz (2017) in that students may require extra help in the initial implementation of the FL model, thereby maximising student engagement and satisfaction earlier in the course (p.114). Teachers must also assume that flipping a classroom demands a certain level of computer literacy and that creating the instructional materials can be very time-consuming (Lo & Hew, 2017; Taylor, 2015), at least in the beginning, since those materials can be reused in future courses. Students have to watch the videos if they want to take advantage of the in-class time. Therefore, videos must be motivating, engaging and attractive (Lo & Hew, 2017).

At this point, we should mention the urgent need for teacher training in the FL model (Lo and Hew, 2017) if we want to do things properly. Poor internet connection to support FL and technology availability issues must also be considered when implementing the FL approach (Gündüz & Akkoyunlu 2019; Ramírez, Hinojosa, & Rodríguez, 2014).

5. Conclusions

Drawing on the findings of this research, it can be maintained that, despite the general preference of students for the flipped model of instruction, there is a need for immediate

feedback in out-of-class sessions. However, we should notice that, even though one of the concerns most raised by the students included not having the teacher available to ask questions during the out-of-class portion, the majority of participants in our study reported that they did not feel disconnected at all (Gilboy et al. 2015; Opazo et al., 2016); although results from other research studies do not corroborate this finding (Arráez et al., 2018).

In sum, students seem to be more satisfied with the FL environment than with the traditional learning environment. The FL approach can promote EFL learning achievement and it affects learners' attitudes towards EFL learning positively (Lee and Wallace, 2018). Moreover, this approach is considered one of the most promising in our days since it integrates technology and active learning strategies (Hung, 2015). We can then conclude that FL is worth implementing, although very careful attention should be paid to the design of the FL environment.

Acknowledgement

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EFL TEACHERS' PERCEPTIONS OF INDONESIAN BLENDED LEARNING COURSE ACROSS GENDER AND TEACHING LEVELS

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Abstract

Studies examining teachers' perceptions of the application of blended learning abound in literature, however, few have explored if the teachers' perception differed in reference to their gender and teaching level. In the current study, English as a foreign language (EFL) teachers' perceptions of Indonesian blended learning practices from the perspective of their gender and teaching levels were examined. A total of 247 EFL teachers across teaching levels, i.e. lower secondary school, upper secondary school, university, informal education and other levels were surveyed. Statistical analyses using Rasch Model and ANOVA were performed to analyse the quantitative data. The findings showed that teachers' perceptions about blended learning were positive but were not statistically significantly different between male and female teachers. Regarding teaching levels, teachers' perceptions about skill and experience and their motivation to exercise blended learning were significantly different (Fskill and experience= 5.373, p < .05; Fmotivation= 2.555, p < .05), whereas the interaction and communication as well as the effectiveness and flexibility domains were not. More specifically, university teachers' perceptions regarding skill and experience statistically differed from those teaching in upper secondary school (M = 2.48, p < .05) and informal education (M = 2.48, p < .05). Insufficient training and supports on blended learning were the primary challenges that constrained teachers from designing and managing the blended learning activities, consequently preventing them from addressing technical issues that emerged during blended learning practices.

Keywords: blended learning; gender; teaching levels; Rasch analysis

1. Introduction

Over the past few years, blended learning has become an increasingly popular teaching and learning approach, widely adopted by various educational institutions around the world

(Krasnova & Vanushin, 2016; Lim & Morris, 2009; Lin & Wang, 2012). Blended learning is viewed as an alternative teaching and learning method that helps teachers to address the critical issue in online learning: the ignorance of traditional face-to-face interaction among teachers and students (Kuo et al., 2015; Woo & Reeves, 2007). Blended learning, also termed as hybrid learning or mixed-mode learning (Solihati & Mulyono, 2017), is an instructional approach that merges traditional face-to-face learning and online learning (Adams et al., 2018; Solihati & Mulyono, 2017). Ocak (2011) views blended learning as an alternative method that allows teachers to balance the proportion of in-class learning and computer-internet-based learning with the use of online communication tools, web-based material, and learning management system. Such a balance benefits the students as they are given a chance to access reliable learning resources and learn at their pace, connect with instructors, and accumulate data regarding their learning progress (Aldosemani et al., 2018).

Some of the potential benefits of the blended learning approach are that it minimises the boundary of only attending face-to-face and online classroom (Kuo et al., 2015), offers greater teaching and learning flexibility for both teachers and students (Alastuey & Perez, 2013; López-Pérez et al., 2011) and blended learning application may reduce course spending in comparison to traditional settings (López-Pérez et al., 2011). Zibin and Altakhaineh (2018) also argue that blended learning improves students' communication skills as it enables student-teacher interactions and expedites student-teacher engagement in both the online and offline environment. After classroom interaction, students could communicate with their teachers and any other peers, which allowed teachers and students flexibility to organise their learning, track the learning progress whenever and wherever they are, as well as self-reflect on their own learning (Alastuey & Perez, 2013).

Specifically in foreign language learning settings, several studies have confirmed the positive contribution of the blended learning approach to classroom teaching and learning practices. Zibin (2018) conducted an experimental study to examine the effect of blended learning towards written discourse involving sixty Jordanians students majoring in English as a foreign language (EFL), revealing that blended learning promoted an easy and enjoyable learning environment. Students who learned English in the blended learning environment achieved better than those who studied in the conventional way, particularly regarding verb morphology and clause combining acquisition. Yang (2012) examined the effect of blended learning for university students with English reading difficulties. One-hundred and eighty-three EFL students in Taiwan participated in the study, divided into an experimental and control groups. The study showed that students benefited from the online and offline learning in a

blended learning environment. Particularly, online learning allowed students to learn without time and place constraints, enabling them to engage in metacognition. Students were also allowed to socially interact with different groups to discuss and obtain feedback.

Despite the positive effect exerted by the application of blended learning method, there is a major concern regarding how the end users, such as teachers and students, perceive the incorporation of blended learning in real classroom settings. Several studies have attempted to address this issue, for instance, Thang, Wong, and Noor (2012) explored undergraduate Malaysian students' perceptions of the blended learning approach in EAP (English for Academic Purposes) via focus groups, finding that most students, from both high proficiency and low proficiency level, had a positive perspective of the course. Students found the course book met their language needs, although those higher proficiency students perceived that the book contents were not challenging. Furthermore, the critical factor of slow and unreliable internet connection limited the students' ability to complete the assignment faster. Hung and Chou (2015) investigated students' perceptions of the roles of blended and online learning instructors, a total of 750 students in a Taiwan private university responded to the Online Instructors Role and Behaviour Scale (OIRBS) survey. The results suggested the importance of the instructors' role as course designer and learning organiser, followed by their role as technology facilitator and discussion facilitator.

In addition to students' perception, many studies have discussed the teachers' perspectives of blended learning, among others are Aldosemani and Shepherd (2018) and Kuo et al. (2015). Aldosemani and Shepherd's (2018) study investigated the instructors' perceptions and challenges of the implementation of blended learning, revealing that academic staff of a public Saudi Arabia University had positive perceptions of blended learning, especially regarding its greater flexibility and that both staff and students can access the material anytime. However, the study also revealed several challenges of blended learning, such as lack of training, experience, and skill, as well as technical difficulties while implementing the blended approach. Kuo et al.'s (2015) study attempted to explore teachers' perceptions and satisfaction towards three interaction types of blended learning: learner-learner interaction, learner-instructor interaction and learner-content interaction. Twenty-two teachers attending a distance education master's programme who participated in this study turned out to be positive about all the interaction types in the blended course, especially the learner-content interaction.

Studies examining teachers' perceptions of the application of blended learning abound in literature, but few have explored if the perceptions differed regarding teachers' gender and teaching levels. This study aims to examine EFL teachers' perceptions of blended learning and

the challenges they encounter during the implementation of blended learning in Indonesian classroom settings. The following research questions will navigate this study:

1) What are EFL teachers' perceptions of blended learning?
2) What challenges do EFL teachers encounter when incorporating blended learning in real classroom settings?
3) Do EFL teachers' perceptions and challenges of blended learning differ in reference to their gender and teaching level?

The findings of the current study will contribute to the current literature on teachers' perspectives of blended learning in reference to their gender and teaching levels. More importantly, the current study may identify potential problems in blended learning practices within Indonesian classroom contexts, thus enabling the related parties to search for solutions to address such issues (Aldosemani et al., 2018).

2. Methodology

2.1. Participants

The current study used a quantitative survey involving a total of 247 EFL teachers from different teaching levels, i.e. lower secondary school (N=53), upper secondary school (N=52), university (N=45), informal education (N=66) and other education level (N=31). These teachers were selected using a convenience sampling technique to gather information from participants in an efficient and an affordable way (Etikan et al., 2016). Details of teacher demography are presented in Table 1 below:

Table 1. Demography of the participants

Demography aspects		N	Percentage
Gender	Female	71	71.3
	Male	176	28.7
Age	20 – 35	195	78.9
	35 – 50	47	19.0
	>50	5	2.0
Educational Background	Bachelor (S1)	186	75.3
	Master (S2)	55	22.3
	Doctor (S3)	6	2.4
Teaching Experience	<5 years	148	59.9
	5 – 15 years	70	28.3
	>15 years	29	11.7
Computer Skill	No Experience	2	0.8
	Beginner	23	9.3
	Intermediate	196	79.4
	Expert	26	10.5

2.2. Data collection

To gather the quantitative data, the current study adapted a five point of Likert scale questionnaire modified from Aldosemani and Shepherd (2018). Briefly, 20 out of the 39 original items relevant to the objective of the current research were selected and classified into four subscales, namely 1) Skill and experience, 2) Motivation, 3) Interaction and communication, 4) Effectiveness and flexibility. Several changes to the items were made, including rewording and reversing negative prepositions. All the items were translated to Bahasa Indonesia to ease of comprehension. The translated questionnaire was then read and reread to ensure readability. The distribution of items in each subscale is presented in Table 2 below.

Table 2. Details of questionnaire subscales and items

Subscale	Item	Code
Skill and Experience (SE)	1. I understand my role in blended learning well.	SE1
	2. I am able to align online course materials with their face-to-face counterparts.	SE2
	11. I incorporate more resources when teaching in a blended learning as compared to traditional learning.	SE3
	13. Adopting a blended teaching approach will result in positive evaluations of my teaching abilities/skill.	SE4
	16. Technical difficulties make the online component of blended teaching frustrating. *R*	SE5
	19. I did not receive sufficient training to design a blended course. *R*	SE6
	20. I did not receive sufficient training to manage a blended course. *R*	SE7
Motivation (M)	5. Having course materials and learning resources ready before the semester starts encourages me to apply blended teaching.	M1
	14. I am more satisfied with teaching in blended environments compared to other delivery methods.	M2
	15. I am looking forward to teaching my next blended course.	M3
Interaction and Communication (IC)	8. My students always pay attention in class although they have already got the course material online. *M*	IC1
	9. I am able to provide better feedback to my students on their performance in blended learning.	IC2
	10. The rate of my interaction in blended learning is higher than in a traditional face-to-face class.	IC3
	17. Not meeting my students face-to-face in a blended setting prevents me from knowing them. *R*	IC4
	18. It is more difficult for me to motivate my students in the online environment than in the traditional setting. *R*	IC5
Effectiveness and Flexibility (EF)	3. Blended learning affects learning becomes more efficient because of its simple planning design. *M*	EF1
	4. The flexibility provided by blended learning benefits me as the teacher. *M*	EF2
	6. I can access online course material anytime and anywhere with the implementation of blended learning. *M*	EF3
	7. I observed that the implementation of blended learning allows my students to access the online course material anytime and anywhere. *M*	EF4

12. I have a higher workload when teaching a blended course as compared to traditional learning. ***R***	EF5

Note: Reverse (***R***) symbol indicates the score of the signed R item is reversed to ease the quantitative data analysis, while ***M*** refers to modified items

The questionnaire was developed and distributed online through social media (i.e. Twitter, Whatsapp, Facebook and Line) to target a wider range of participants (Ningsih et al., 2018). A paper version of the questionnaire was also distributed to teachers to maximise data collection activity. Person reliability and item reliability were calculated soon after the data collection was completed and the results are presented in Table 3 below.

Table 3. Person and item reliablity

	Mean	Separation	Reliability	Cronbach's □
Person	66.6	2.03	.80	.83
Item	822.3	9.88	.99	

As evidenced in Table 3 above, the person reliability index was .80 while the item reliality index was .99, indicating moderate internal consistency of participant responses and the quality of questionnaire items was excellent (Linacre, 2018). In addition to the two reliability indices, the computation of Rasch model resulted in a Cronbach's α = .83 suggesting that the questionnaire is highly reliable (Adams et al., 2018; Cohen et al., 2018). The α value also depicts a high interactional level between the person and the questionnaire items. It is crucial to explain here that the reliablity level of questionnaire in the current study was lower than that of Aldosemani et al. (2018), which may be due to our decision to exclude nineteen irrelevant items out of a total of thirty-nine items in the original questionnaire.

2.3. Data analysis

The collected quantitative data were analysed using a three-stage data analysis procedure of Mulyono, Liestyana, Warni, and Suryoputro (2019). First, the collected data were coded and tabulated using Microsoft Excel software. Then, two file formats were produced from the tabulation, including .xlsx and .txt file. Specifically, the .txt file was used to help the researcher compute the quantitive data in Rasch software. Second, statistical data analyses were performed using Rasch analysis and ANOVA. The data in .txt file were stored in Winstep 4.3.4 software to allow the calculation of the reliability of the questionnaire, and to examine "distribution and the quality of responses input of the participants" (p. 4). ANOVA was performed to evaluate interactions between the demograpic aspects, i.e. gender and teachers' teaching level and the subscales of the questionnaire.

3. Findings and discussion

3.1. EFL teachers' perceptions and challenges of blended learning

The Rasch analysis suggested that the separation of questionnaire items was 9.88, allowing the classification of items into ten strata (see Table 5), the logic scores were distributed well and were capable of discriminating the participant responses (Linacre, 2018). The ten-item strata ranged from the most difficult item to be agreed (logit score = 1.65 item SE6) to the easiest item to be agreed (logit score = -1.56 item EF3). Table 4 and 5 present the descriptive statistics of each questionnaire indicator and the item strata:

Table 5. Descriptive statistics of indicator logit

Indicator	Mean	SD
Skill and Experience	22.0	.78
Motivation	10.8	1.52
Interaction and Communication	15.7	.87
Effectiveness and Flexibility	18.1	.95

Table 6. Classification of items based upon their strata

Category	Criteria	Item/LVI
More Difficult to be agreed		
Difficulty Strata I	1.28<LVI	SE6 (LVI = 1.65)
		SE7 (LVI = 1.60)
Difficulty Strata II	0.93<LVI<1.28	IC5 (LVI = 1.27)
		SE5 (LVI = 1.01)
Difficulty Strata III	0.44<LVI<0.93	IC3 (LVI = 0.92)
		EF5 (LVI = 0.81)
Difficulty Strata IV	-0.07<LVI<0.44	IC4 (LVI = 0.43)
		M2 (LVI = 0.37)
Difficulty Strata V	-0.40<LVI<0.07	SE3 (LVI = -0.08)
		IC1 (LVI = -0.18)
Easier to be agreed		
Difficulty Strata VI	-0.59<LVI<0.40	EF1 (LVI = -0.41)
		SE2 (LVI = -0.49)
Difficulty Strata VII	-0.64<LVI<0.59	SE1 (LVI = -0.60)
		IC2 (LVI = -0.64)
Difficulty Strata VIII	-0.74<LVI<0.64	EF4 (LVI = -0.65)
		SE4 (LVI = -0.70)
Difficulty Strata IX	-1.07<LVI<0.74	M3 (LVI -0.75)
		EF2 (LVI = -0.91)
Difficulty Strata X	-1.07<LVI	M1 (LVI = -1.08)
		EF3 (LVI = -1.56)

Table 5 provides information regarding person preferences towards twenty items of blended learning perceptions, with items EF3 (logit score = -1.56), M1 (logit score = -1.08), EF2 (logit score = -0.91), and M3 (logit score = 0.75) most selected by respondents. This indicates that teachers benefited from the blended learning method in which they could access online course materials anytime and anywhere (EF3). Teachers felt motivated to apply blended learning (M3) due to the availability of course materials prior to the start of the semester (M1) and the flexibility offered by the blended learning method (EF2). In addition, items SE6 (logit score = 1.65), SE7 (logit score = 1.60), IC5 (logit score = 1.27), and SE5 (logit score = 1.01) were the least item selected by the respondents, indicating that EFL teachers did not receive sufficient training to design the blended learning method (SE6) or to manage a blended learning course (SE7). Teachers also experienced difficulty in motivating students in blended learning course (IC5) and to address technical issues in blended learning practices (SE6).

Teachers' positive perceptions regarding the practice of blended learning is evident in the literature (Aldosemani et al., 2018; Borup et al., 2011; Woods et al., 2004). In particular, the current study's findings correspond to those of Aldosemani et al. (2018) suggesting that teachers benefited from the flexibilty of blended learning practices. The application of blended learning had allowed teachers to access the teaching and learning materials without having time and place constraints. However, insufficient technological training and support provided by school/university administrations were identified as the main challenges by Indonesian EFL teachers, like Aldosemani et al.'s (2018) study. Technological training for teachers would address this issue, training teachers about blended modes of teaching models, approaches, tools and frameworks (Aldosemani et al., 2018). Similarly, Villalon (2017) argues that teachers' technological competence and their knowledge of the teaching and learning materials will benefit their further implementation of blended learning courses.

3.2. Differences in EFL teachers' perceptions in reference to their gender and teaching level

The third research question aimed to determine if there were any differences in EFL teachers' perceptions about blended learning in reference to their gender and teaching levels. The Person-Differential Item functioning (DIF) of the person logit value in reference to participant gender was analysed and the results are presented in Figure 1 below:
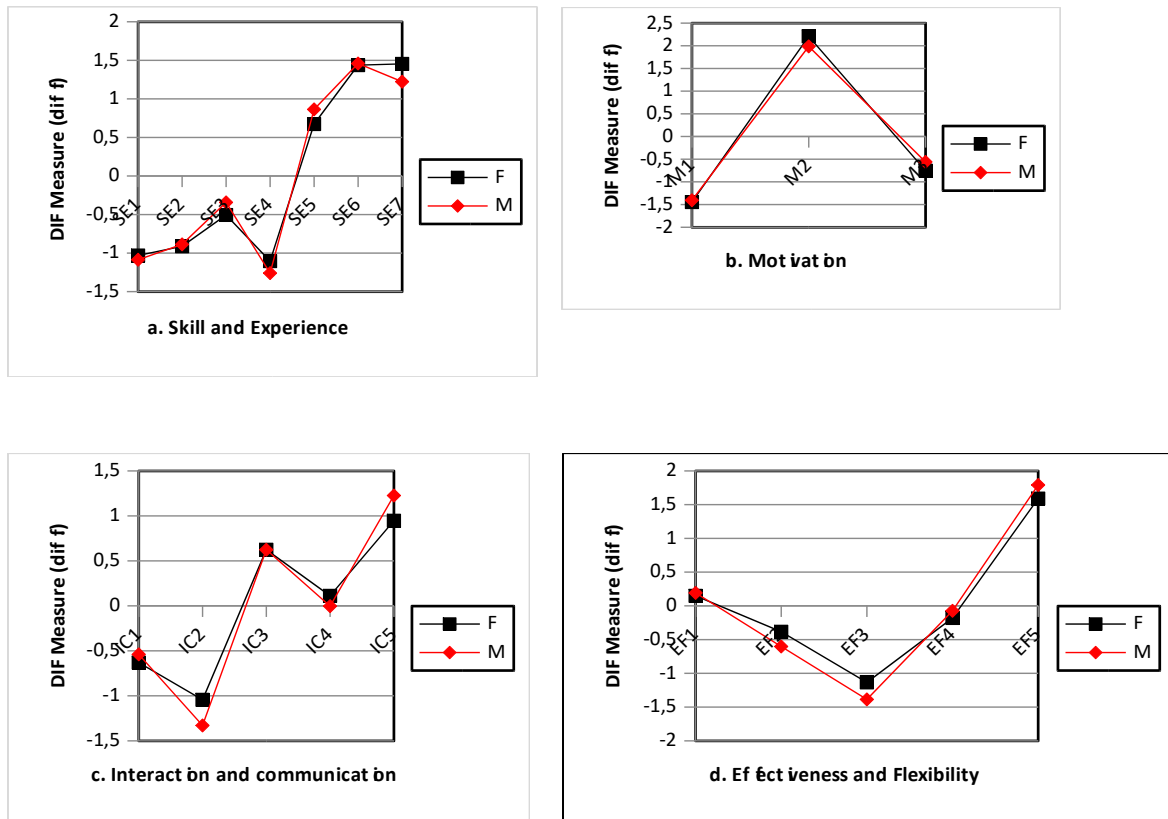
Figure 1. DIF measurement on gender

Figure 1 shows the DIF gender measurement on teachers' responses towards 20 items included in the questionnaire divided into four indicators (e.g., skill and experience, motivation, interaction and communication, and effectivity and flexibility). Figure 1 (a) shows that males and females had a similar perception of having knowledge of blended learning well (SE1, *diff M = -1.0868, diff F = -1.032*) and having the ability to adjust online materials with traditional learning materials (SE2, *diff M = -0.8874, diff F = -0.9125*). Female teachers were more comfortable incorporating many learning material sources in the blended learning classroom rather than traditional learning classroom compared to their male counterparts (SE3, *diff = -0.5057*), whereas male teachers had a more positive outlook than females on the impact of applying blended learning on improving their teaching abilities (SE4, *diff = -1.2601*).

In addition, female teachers were more frustrated with technical constraints in applying blended learning methods (SE5, *diff = 0.6726*), while male teachers found it difficult to manage blended learning course due to lack of training (SE7, *diff = 1.2223*). The reason for these issues were that both males and females mentioned that they did not obtain sufficient training to design and practice the blended learning method (SE6, *diff M = 1.4589, diff F = 1.4378*). Male

and female teachers' perceptions regarding the desires and awareness of teachers in using blended learning innovations in the classroom are shown in Figure 1b. Both male and female teachers were very enthusiastic to apply the blended learning method (M1, *diff M = -1.4072, diff F = -1.4465*) but they had different perceptions about teaching satisfaction. Male teachers preferred the blended learning method to other delivery methods (M2, *diff = 1.9856*), while female teachers were eager adopt the blended learning method as they always took the opportunity to apply it (M3, *diff = -0.7521*).

In terms of interaction and communication, both male and female teachers affirmed that their students were able to pay attention in the classroom as well as in the online learning environment (IC1, *diff M =-0.5393, diff F = -0.6311*). This certainly is a positive aspect for the students as they can understand learning with blended methods. Moreover, teachers played a role in providing positive input to students regarding their performance, with male teachers more likely to be more dominant in this regard than female teachers (IC2, *diff = -1.3298*). In blended learning applications, both male and female teachers had the ability to allocate more blended interactions than face-to-face learning (IC3, *diff M = 0.6238, diff F = 0.6238*). However, male teachers perceived that blended learning methods could reduce the interactions between teachers and students to recognize each other well (IC4, diff = -0.0029). Such an issue may be affected by the lack of face-to-face classroom meeting. Another difficulty was also encountered by female teachers, who found it difficult to motivate students when using blended methods rather than traditional learning (IC5, *diff = 0.9464*).

Blended learning also offers some benefits in terms of effectiveness and flexibility in classroom learning. One of the benefits agreed by both male and female teachers was that the blended learning method could create a more efficient learning process (EF1, *diff M = 0.1911, diff F = 0.1485*). Moreover, male teachers perceived that blended learning could assist them to be more flexible in teaching (EF2, *diff = -0.6025*) and had access to the online material (EF3, *diff = -1.3864*). In addition, male and female teachers believed that their students could also access the material in online databases (EF4, *diff M = -0.0741, diff F= -0.1801*). The critical issue related to the workload in blended learning environment was that male teachers more than females felt that the blended learning method was a burden (EF5, *diff = 1.589*).

One-way ANOVA showed that male and female perceptions about blended learning were not statistically different for all indicators, (p value > .05). This finding confirmed an earlier study by Villalon (2017), who suggested that there was no statistically significant difference between male and female teachers' attitudes when practising blended learning. More specifically, the inability of male and female teachers to address technical issues while

implementing blended learning found in the current study was primarily due to lack of technological training received by both teachers.

In addition to gender, Rasch analysis and ANOVA were performed to examine teachers' perceptions of blended learning in reference to their teaching levels. To this end, the Person-DIF of the person logit value in reference to participant teaching level i.e. lower secondary school level (LS), upper secondary school (US), university (U), Informal Education (IE), other education level (OE) was examined and the results are presented in Figure 2.
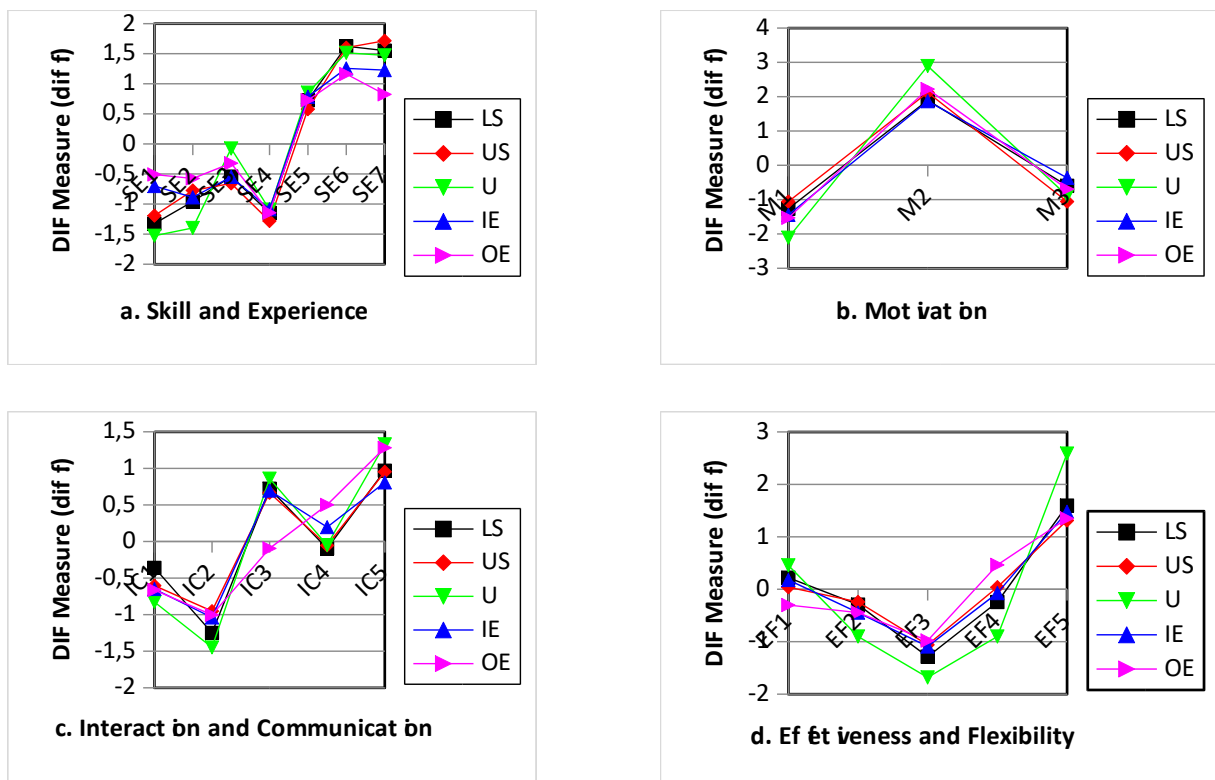
Figure 2. DIF measurement on teaching level

As shown in Figure 2(a), university teachers had a better understanding of the context of blended learning (SE1, *diff = -1.5279*) and were more competent in adjusting material for blended learning (SE2, *diff = -1.3979*) compared to those teaching at other levels. Teachers from lower secondary school, upper secondary school and informal education combined more teaching material in blended learning (SE3, *diff LS = -0.5431, diff US = -0.6575, diff IE = -0.5495*). It is interesting, but not surprising, that all teachers from all levels had a similar view about the positive impact of using the blended learning method (SE, *diff LS = -1.1456, diff US = -1.2825, diff U = -1.092, diff IE = -1.0866, diff OE = -1.1456*). However, technical obstacles often made upper secondary school teachers feel unsure and even frustrated, as indicated by

item SE5 (*diff = 0.577*), while some teachers teaching in informal education and other educational level encountered difficulties due to lack of training regarding the design and use of blended learning methods (SE6 (*diff IE = 1.2552, diff OE = 1.1624*). More importantly, teachers from other educational levels had more difficulty in managing blended learning as they did not receive sufficient blended learning training (SE7, *diff = 0.8228*).

With regards to the motivation to practice blended learning, university teachers were more enthusiastic than other teachers (M1, *diff = -2.1118*), but they were not too satisfied with the blended learning method compared to using other methods (M2, *diff = 2.8914*). Moreover, all teachers had a similar view of looking forward to every opportunity to use the blended learning method in teaching (M3, *diff LS = -0.5969, diff US = -1.0588, diff U = -0.8877, diff IE = -0.3685, diff OE = -0.6947*).

Furthermore, in terms of interaction and communication, university teachers felt more comfortable with students who still paid attention to learning when using blended learning or not (IC1, diff = -0.8273). University and upper secondary school teachers motivated their students better in the blended learning environment (IC2, *diff N = -1.2493, diff O = -1.4489*). Teachers from other educational levels interacted with their students more when using blended learning than when using face-to-face methods (IC3, *diff = -0.0952*). It is interesting that lower secondary school, upper secondary school and university teachers felt that blended learning prevented them from getting to know students well, as indicated in item IC4 (*diff LS= -0.0956, diff US = -0.0544, diff U = -0.0486*), while lower secondary school, upper secondary school and informal education teachers experienced difficulty in motivating their students when exercising the blended learning method (IC5, *diff* LS = 0.9697, *diff* US = 0.9532, *diff* IE = 0.8072). In addition, item EF1 ('Blended learning affects learning becomes more efficient because of its simple planning design') was experienced more by other educational level teachers (*diff* = -0.3014), although the flexibility of blended learning was addressed more by university teachers (EF2, *diff* = -0.902). University teachers felt it was more convenient to access material online wherever and whenever they needed (EF4, *diff* = -0.9018). Such benefits may be why university teachers have a lesser workload than other teachers (informal education, primary, lower, and upper secondary school), as informed by item EF5 (*diff = 2.5866*). It is important to mention here that university students are likely to have better computer skills than those secondary school students, allowing them to use computer technology in learning at their ease (Adams et al., 2018; Islam, 2011). In other words, students at a higher level of education may possess a higher level of blended learning readiness, accordingly, their university teachers

are more likely to apply blended learning in their teaching practices compared to teachers from other teaching levels.

To identify the significant differences of teachers' perception across the teaching level, one-way ANOVA test was performed, showing that teachers' perceptions about blended learning were statistically different, particularly regarding their skill and experience (F= 5.373, $p < .05$) and motivation to exercise blended learning (F= 2.555, $p < .05$). Teachers' perceptions of the interaction and communication in the blended learning environment and the effectiveness and flexibility offered by blended learning was not influenced by their teaching levels ($p > .05$). A Tukey posteriori test was conducted to explore the exact factor that indicated the significant differences across teachers' teaching levels. The post-hoc calculation showed that university teachers had a significantly different perception from upper secondary school teachers (M = 2.48, $p < .05$) and informal education teachers (M = 2.48, $p < .05$) in the skill and experience domain.

4. Conclusion

The current study aimed to explore EFL teachers' perceptions and challenges regarding blended learning and the extent to which teachers' perceptions differed in relation to their gender and teaching level. The Rasch analysis and ANOVA calculation showed that EFL teachers' perceptions about blended learning were different regarding their gender, although the difference was not statistically significant. Regarding teaching levels, teachers' perceptions about skill and experience and motivation to exercise blended learning was statistically different ($F_{skill\ and\ experience}$= 5.373, $p < .05$; $F_{motivation}$= 2.555, $p < .05$) but not significant for the interaction and communication and the effectiveness and flexibility domain. More specifically, the current study found that university teachers had a significantly different perception from upper secondary school teachers (M = 2.48, $p < .05$) and informal education teachers (M = 2.48, $p < .05$) in the skill and experience domain. The findings also highlighted the issue of teachers' insufficient training regarding the design and use of blended learning activities, as well as lack of training and support for their inability to address any technical issues encountered during the blended learning practices.

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DOES *DYNED* AFFECT STUDENTS' ATTITUDES
AND LANGUAGE SKILLS IN EFL? A CASE STUDY

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Abstract

Computer-assisted language learning (CALL) is one of the developing approaches that can assist to improve the language skills (reading, writing, listening) of students in English as a foreign language (EFL). CALL has been used to teach EFL learners through language drills or skills practice to stimulate discussion and interaction, or as a tool to improve writing and research. This study aims to point out the effects of *DynEd* on attitudes and language skills in EFL of middle school students in Turkey. The study contributes to the area of EFL learning and fosters students' perceptions of EFL. The sample of this study, which utilized an ex-post facto design, recruited 136 middle school students as participants. According to the results, it can be said that, in addition to the conventional teaching environment, the use of *DynEd* significantly improved both the language skills and attitudes of the students in EFL. However, *DynEd* did not make any difference in students' attitudes towards EFL according to grade level and gender. Moreover, students using *DynEd* have expressed positive views about *DynEd*.

Keywords: CALL; *DynEd;* EFL; computer-assisted instruction; language skills

1. Introduction

Computers have become an important part of life (Lan, Chen, & Sung, 2017). Therefore, most students use technology (PC games, applications, etc.) to enhance their learning (Vazquez-Calvo, Zhang, Pascual, & Cassany, 2019). A similar trend is seen in the academic world (Chinnery, 2006). Studies show that computer technologies support educational activities in a meaningful way (Blattner & Fiori, 2009). There have been significant improvements in the field of education and training and in the use of computer-aided instructional materials in

almost every discipline. Also, language education requires productive training materials for various courses because it includes reading, writing, listening and speaking elements to communicate (Kohnke, 2019; Nushi, Shafeie, & Shafiei, 2017). The trend towards computer technologies has enabled the use of computers in learning environments and English as a foreign language (EFL) learning (Baş & Kuzucu, 2009). Many studies have suggested that computers are useful resources in learning new vocabulary and supporting teaching in classroom settings (Kung & Chuo, 2002). Most of these approaches and methods have focused on using technology to develop more effective language teaching to enhance learners' motivation and autonomy in digital environments. It is important to investigate the effects of these technologies on language skills. Therefore, the purpose of this study is to investigate the effectiveness of a computer-assisted language learning (CALL) software, *DynEd*, on English language skills (reading, writing, listening). Also, this study aims to determine the effect of *DynEd* on middle school students' attitudes towards EFL and whether they change according to gender and grade level.

2. Literature review

Studies that have compared the effectiveness of conventional and contemporary methods on language learning suggest that the contemporary methods which include the implementation of computer-assisted language learning are more productive than the conventional ones (Godwin-Jones, 2011; L. Lee, 2019; Sauro & Zourou, 2019). Therefore, the teachers who would like to engage learners' attention have been trying to move from conventional to contemporary methods by using CALL to provide supplementary practice on EFL skills such as writing, reading, speaking and listening, as well as grammar and problem-solving. Besides, CALL is a way for teachers to help learners become more autonomous. Most students have stated that the use of technology has enhanced their learning. It has improved the learner autonomy, helped teachers to teach more effectively, and increased the participation of students (Sung & Yeh, 2012). Therefore, teachers can control how effective computers will be for learners. On the other hand, they do not need to feel anxious about being replaced by computers (Brierley & Kemble, 1991). Moreover, in order to instruct language learners to use the computer effectively and efficiently, teachers must have sufficient experience (Chapelle, 1990). The developments of CALL have paved the way for more detailed work on language (Hubbard, 2009).

Early attempts were made to teach certain foreign languages on mainframe computers in the 1950s and 1960s (Beatty, 2013). With the expansion of the personal computer in the early 1980s, CALL became a prominent area. Although the programs had not been developed

specifically for the English language, the globalization of English has made the programmers focus on it more. Since technology has been improved, many approaches and methods have been implemented in foreign languages, especially English language teaching because of the increasing interest (J. S. Lee, 2019; Liu, Moore, Graham, & Lee, 2002). A large number of studies have also pointed out the role of CALL in the learning process (Burston, 2014). Learners have realized the importance of using various techniques, especially CALL, to engage themselves in learning.

2.1. **Digital tools used in CALL**

Various software has been created to support other technological devices such as mobiles, tablets, laptops, etc. to help learners. In addition to computers, mobiles have also become important devices in learners' lives. Most programs have developed mobile-friendly applications to offer those learners who do not have access to computers a chance to improve language learning. Moreover, social media (e.g., *YouTube, Facebook, Twitter*) encourage learners to use technology to be more confident and active in speaking and writing in English (Peeters, 2018; Y.-C. Sun & Yang, 2015). Besides, EFL students have stated that they benefit from CALL via bloggers and web applications which provide inputs to enhance the language learning (H. Huang, 2015). *Duolingo*, *Busuu*, *Babbel, Voscreen*, *Voxy,* and *DynEd* are some examples of these applications.

In a case study, *Duolingo* was used in two Spanish university courses (Munday, 2016). The study suggested that *Duolingo* was useful and an easy-to-use app. Also, the students usually enjoyed it because of its gamified aspects, easy access and mobile friendly interface. In a recent study conducted by Ajisoko (2020), *Duolingo* was found user friendly, it made learning easier and eliminated boredom while learning English. In another study, the participants enjoyed using *Busuu* to learn English and had meaningful learning experiences (Citrayasa, 2019). While examining the effectiveness of *Babbel* in learning a foreign language, Loewen, Isbell, and Sporn (2020) found that students developed grammar, vocabulary and communication skills. Another language learning tool, *Rosetta Stone*, increased the motivation and supported students' EFL learning (Huang and Liu, 2020). The *Voscreen* app has improved students' attitudes towards learning English, enabled them to spend time learning languages outside the classes, and contributed to their listening and speaking skills (Karaduman, 2018). Finally, in a quasi-experimental study, although students used *Voxy* with less frequency than recommended, their English language proficiency improved (Faria, Bergey, Baird, & Lishinski, 2019).

It is suggested that such tools are generally reliable for language learning (Rosell-Aguilar, 2018), learners are ambitious and motivated to learn with these tools (Brown, Castellano, Hughes & Worth, 2012; Ajisoko, 2020), and these tools have the potential to improve their language skills (Rosell-Aguilar, 2017; Ajisoko, 2020; Loewen et al., 2019). Goksu, Ozkaya and Gunduz (2020), who conducted the content and bibliometric analysis of *CALL* journals, found that research on CALL and language learning tools is concentrated on higher education. Therefore, in this study, it is important to investigate *DynEd* with the middle school sample to understand how *DynEd* affects students' English language skills and their attitudes towards EFL learning

2.2. Description of *DynEd*

DynEd was founded in 1987 in San Francisco by Lance Knowles and Douglas Crane. The company produced and patented the world's first language training CD-ROM. Since then, it has been used by countries where English is not the official language. *DynEd* courses cover all proficiency levels and include courses for all ages and areas (e.g., k12, university, all occupations). *DynEd* courses have been approved by Ministries of Education in several countries, including France, China, Mongolia, Turkey and Malaysia. "The Country Management Partner" of *DynEd* International, Inc. since 2000, was founded in Turkey in 1993 ("*DynEd*," n.d.). In 2006, the Turkish Ministry of National Education (MEB) took an important step in the implementation of *DynEd* language learning software in public schools. *DynEd* has been used since the 2006-2007 academic year as a way of encouraging learners to move from teacher dependence towards autonomy, which is a very important aspect of language learning.

DynEd is a blended language learning tool that combines the features of traditional learning and contemporary multimedia technologies. *DynEd* places students at appropriate levels with artificial intelligence methods and adjusts the learning stages for each student according to their difficulty levels. It also calculates a study score by assessing students' progress and provides feedback following the behavioural learning model. *DynEd* specializes in English education and classifies learning for different age groups and levels.

2.3. *DynEd* related research

As a result of the integration of education with technology, a great deal of research has been conducted to prove whether the relationship between education and technology is functional or dysfunctional. Some of the research has been done on *DynEd*. In the recent years, the number of research carried out to analyze the effects of *DynEd* on EFL teaching and learning has

increased rapidly. However, the findings have been inconclusive. Some studies collected data from teachers who used the software in their classes regularly (Baş, 2010; Yigit, & Özgan, 2011). Yigit and Özgan (2011) pointed out that the teachers expressed positive feelings about the use of *DynEd* if the problems encountered in the software could be improved. They also suggested that the software helped the teachers to improve their ways of teaching. Moreover, it had positive outcomes if it was regularly used in the classroom. On the other hand, it triggered such problems as lack of equipment, crowded classes, administrative support, and etc. (Yiğit, 2012). Besides, students had a more positive perception of *DynEd* than teachers (Ellsworth, 2015; Şengel, Öncü, & Baltacı Göktalay, 2012; Yigit & Özgan, 2011). In addition to the teachers' perceptions of *DynEd*, some research has analyzed the effects of *DynEd* on students' language skills and motivation concerning English language skills.

While some studies spoke in favour of *DynEd*, others concluded the opposite. The studies which had positive results stated that there had been significant differences concerning the implementation of *DynEd*. It is suggested that *DynEd* improved language skills, motivation and attitudes of the students towards English learning compared to conventional teaching (Baş & Kuzucu, 2009; Bulut-Özek & Pektaş, 2016). On the contrary, it did not contribute significantly to the students' attitudes towards English courses (Inal & Korkmaz, 2019). On the other hand, some studies stated that *DynEd*-related activities had no significant effects on language skills as the software did not correspond to the contexts taught in schools (Şengel, Öncü, & Baltacı Göktalay, 2014). However, J. Huang and Wu (2013) stated that *DynEd* enhanced students' language skills, especially listening and speaking skills but had no significant improvement effects on writing and reading skills. Moreover, some studies stated that it enhanced students' autonomy (Meri, 2012).

Since *DynEd* intends to meet the individual learning needs of students and enhance their learning experiences by supporting EFL instruction, it may be necessary to explicitly address the impact of *DynEd* on attitudes and language skills in EFL. Nowadays, EFL learning opportunities are constantly improving via technology use; thus, it is important that *DynEd* provides up-to-date data on the impact of *DynEd* on students' EFL attitudes and language skills at the middle school level. Also, the literature mostly focused on teachers' or students' views, perceptions, experiences on *DynEd*, indicating the need for this study. On the other hand, this study can make an important contribution to the literature in terms of examining the effect of *DynEd* with the natural use (non-interventional) by students.

3. Methodology

3.1. The aim of the study

This study examines the potential of *DynEd* in helping middle school students to improve language skills in EFL, specifically reading, writing, listening easily and using these skills independently. In addition to language skills, the study investigates the effect of *DynEd* on shaping the attitudes of students about EFL learning. This research aims to answer the following questions:

RQ 1. Does *DynEd* improve students' language skills in EFL?

RQ 2. Does *DynEd* affect attitudes of students concerning EFL learning?

RQ 3. Do the attitudes of students using *DynEd* differ according to gender and grade level?

RQ 4. What are the students' views about *DynEd*?

3.2. Participants and the research context

The research was conducted with a group of 136 students from 5th to 8th grade attending a middle school in a village of Mardin, the southeast Turkey. Data were collected during the second semester of the 2018-2019 academic year. In this research, the participants were academically high, middle and low-level students. Based on the research method, no action was taken to equalize the initial proficiency levels of the students. The number of students who used *DynEd* was 64 while the number of students who never used *DynEd* was 72. The number of students who used *DynEd* was collected via Record Manager which shows the test scores, study time and frequency, learning path, and detailed information about how the student studies features such as voice record, speech recognition, and repetition. However, the data that the Record Manager provides was not sufficient as most students who used *DynEd* out of school ran the software offline for more than 14 days, which prevented the data transferring process to the software. Therefore, the rest of the data were collected with daily collections from the students. The sample characteristics are shown in Table 1.

Table 1. Sample characteristics

		Students who used *DynEd*		Students who did not use *DynEd*	
		f	%	*f*	%
Gender	Female	36	56.25	39	54.17
	Male	28	43.75	33	45.83
Grade	5th Grade	14	21.88	17	23.61
	6th Grade	8	12.50	17	23.61
	7th Grade	26	40.63	23	31.94
	8th Grade	16	25.00	15	20.83
Total		64	100.00	72	100.00

3.3. Design and procedure

This study utilized an ex-post facto research design which investigated the effect of *DynEd* on language skills in EFL. The ex-post facto research design identifies the causes and consequences of the differences in a non-experimental setting. Ex-post facto research design is a type of research design in which the investigation emerges without interference of the researcher (Salkind, 2010). Ex-post facto research can also be used instead of experimental research design, to test hypotheses about cause and effect in situations where it is not feasible or difficult to control or manipulate the independent variable. Moreover, this design is used as an alternative to experimental design because sometimes the latter is either too expensive (Cohen, Manion & Morison, 2011) or impossible to set up. In this study, the students who used and did not use the *DynEd* Software which was offered by the Ministry of Education as a supportive software for students to learn English formed two natural groups. The reason for choosing the ex-post facto research design was to investigate the effect of using *DynEd* on language skills in EFL and attitudes of students in their natural learning processes.

Firstly, pre-tests were applied to determine the students' initial language proficiency in reading, writing, listening and attitudes on EFL. Some students used *DynEd* outside of the school and as well as during the conventional teaching process at school for 8 weeks (N=64). At the end of the 8 week-period, the students who never used *DynEd* were identified (N=72). The proficiency and attitude tests which were applied to all students at the beginning of the study were reapplied. Moreover, the opinions of the students who used *DynEd* regarding the software were obtained. The research process is presented in Figure 1.
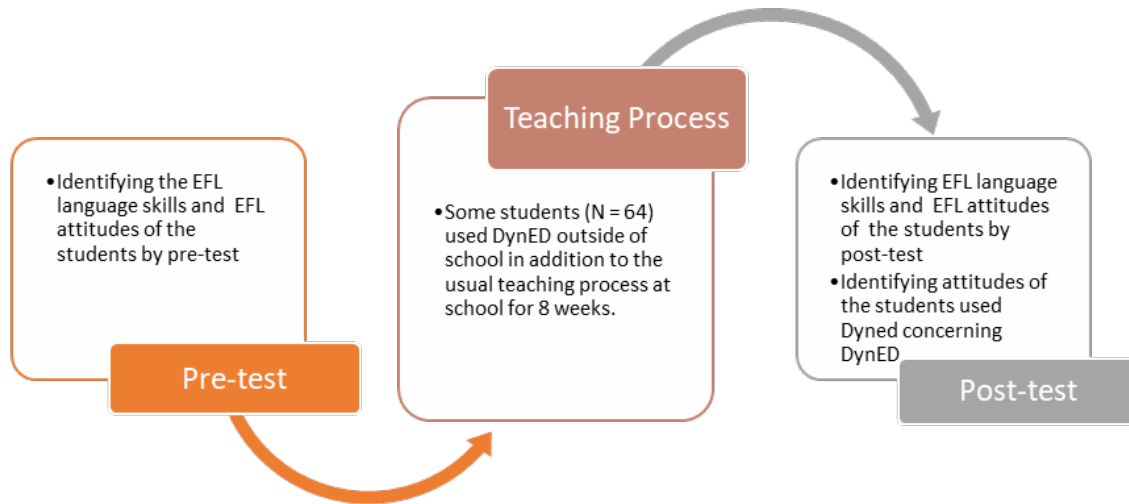
Figure 1. Research process

3.4. Data collection tools and procedures

Data were gathered by using pre- and post-tests, which is widely used by many researchers (Dugard & Todman, 1995). The tests consisted of questions aiming at measurement of students' proficiency levels in reading, writing and listening in English, whose reliability and validity were verified by the researchers. The tests were finalized by making necessary corrections according to the feedback received from English and Turkish teachers. In this study, the Kuder-Richardson (KR-20) value was determined as acceptable (KR-20$_{\text{pre-test}}$ = .921, KR-20$_{\text{post-test}}$ = .928). The English proficiency test consisted of 16 listening, 15 writing and 6 reading questions.

An attitude measurement scale was implemented to collect data about students' attitudes towards EFL. According to the findings of the exploratory factor analysis of the scale, it had a structure composed of one dimension. According to the Cronbach Alpha analysis, the reliability of the scale was 0.86 (Aydoğmuş & Kurnaz, 2017). In this study, the Cronbach Alpha value was 0.80 for the pre-test and 0.83 for the post-test. Also, a demographic scale prepared by the researchers was applied to analyze the result based on class and gender. The form developed by Baz and Tekdal (2014) was used to determine students' views on *DynEd*.

3.6. Data analysis

The data obtained in this study were analyzed through descriptive and inferential statistics in the IBM *SPSS* program. Information about the statistical techniques used in the analysis of the research questions is given in Table 2.

Table 2. The statistical analysis techniques of the research questions

Research Questions	Statistical Techniques
RQ 1 and RQ 2	General linear model
RQ 3	Independent samples *t*-test and One-way ANOVA
RQ 4	Descriptive statistic

The mean value of the data obtained with the attitude scale in the English course was interpreted respectively as "positive attitude" in the 1.00-1.66 range, "indecisive attitude" in the 1.67-2.33 range, and "negative attitude" in the 2.34-3.00 ranges. Student views on *DynEd* were analyzed descriptively. To conduct the statistical analysis, initially, the assumption of normality was checked. The variables of pre-test attitude [Skewness = 1.54, Kurtosis = 0.46], post-test attitude [Skewness = 1.82, Kurtosis = 0.03], pre-test language proficiency [Skewness = -1.28, Kurtosis = 0.05] and post-test language proficiency [Skewness = -1.23, Kurtosis = -0.11] in which Skewness and Kurtosis values were found within the range of +1.96 to -1.96, which is the acceptable value range by Field (2009). Therefore, the necessary assumptions were checked before applying the statistical analysis techniques stated in Table 2.

4. Findings

4.1. The effect of *DynEd* on students' EFL skills

To determine whether there was a meaningful difference between EFL language skills (listening, writing, reading) of students who used and did not use *DynEd*, the *Univariate General Linear* model method was used. The post-test language proficiency scores corrected according to the pre-test scores and obtained before the implementation are given in Table 3.

Table 3. Post-test language proficiency scores and corrected scores based on the pre-test

Group	N	M	SD	Corrected Mean	Standard Error
DynEd Users	64	24.65	6.89	21.75	.62
DynEd Non-Users	72	15.87	7.96	18.95	.58

Table 4 shows the results of the comparison of EFL skills levels at the end of the learning and teaching processes by controlling the initial EFL proficiency levels of the two groups used and did not use *DynEd*.

Table 4. Comparison of post-test language proficiency of groups who used and did not use *DynEd*

Source	Sum of Squares	SD	Mean Square	F	p	Partial Eta Squared
Corrected model	7484.20	3	2494.73	125.55	.00	.74
Intercept	779.13	1	779.13	39.21	.00	.22
Groups	**136.81**	**1**	**136.81**	**6.88**	**.01***	**.05**
Pre-test	4841.87	1	4841.87	243.68	.00	.64
Groups * Pre-test	37.54	1	37.54	1.89	.17	.01
Error	2622.79	132	19.87			
Total	64547.00	136				
Corrected total	10106.99	135				

* Significant at $p < .05$ level

When the initial EFL proficiency of the students who used and did not use *DynEd* were taken under scrutiny, it became evident that there was a significant difference between the groups' language proficiency levels in English language skills after the implementation process was completed in both groups ($F(1,136) = 6.88$, $p = .01 < .05$, $r = 0.05$). In other words, the students who used *DynEd* had higher scores than the students who did not use *DynEd*. Consequently, *DynEd* contributed significantly to the EFL skills of students who used *DynEd* compared to those students who did not use it.

4.2. The effect of *DynEd* on attitudes of students

The *Univariate General Linear Model* method was used to determine whether there was a significant difference in the attitude levels of the students who used *DynEd* compared to those students who did not use *DynEd*. Descriptive data on post-test corrected according to students' pre-test ELF attitude levels are given in Table 5.

Table 5. Post-test attitudes and post-test attitudes corrected according to pre-test

Groups	N	M	df	Corrected Mean	Standard Error
DynEd users	64	1.18	.17	1.19	.02
DynEd non-users	72	1.32	.31	1.30	.02

Table 6 shows the results of the comparison of attitude levels at the end of the period by controlling the initial attitude levels of the groups who used and did not use *DynEd*.

Table 6. Comparison of post-test attitude levels of groups who used and did not use *DynEd*

Source	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Corrected model	3.99	3	1.33	31.46	.00	.41
Intercept	3.40	1	3.40	80.58	.00	.38
Groups	**.55**	**1**	**.55**	**13.18**	**.00***	**.09**
Pre-test	1.82	1	1.82	43.27	.00	.24
Groups * Pre-test	.81	1	.81	19.37	.00	.12
Error	5.58	132	.04			
Total	225.11	136				
Corrected total	9.57	135				

* Significant at $p < .05$ level

When the pre-attitudes of students who used and did not use *DynEd* were controlled, it became clear that there was a significant difference between the groups' attitudes towards English after the implementation process was completed in both groups ($F(1,136) = 13.18$, $p = .00 < .05$, $r = .09$). In other words, there was a significant difference in the attitude of the students used *DynEd* towards English compared to students who did not use *DynEd*. As a result, *DynEd* contributed to students' positive attitude towards learning English.

4.3. Analyzing the attitudes of students used *DynEd* by gender and grade level

An independent samples *t*-test was used to determine whether the attitudes of students who used *DynEd* differed by gender and the results of the analysis are given in Table 7. When the homogeneity of the variances was examined ($p = .06$), it was found that the variances were not meaningful, in other words, they showed a homogeneous distribution. When the means of EFL attitudes were analyzed, it is seen that the attitudes of male students ($M = 1.15$, $SE = .02$) are almost equal to female students ($M = 1.21$, $SE = .03$). However, it is stated that the difference was not significant ($t(62) = -1.36$, $p > .05$, $r = .16$).

Table 7. Analysis of attitude results by gender

Gender	N	M	SE	t	p
Male	28	1.15	.02	-1.36	.17
Female	36	1.21	.03		

One-way ANOVA was used to analyze whether EFL attitudes of students who used *DynEd* differed according to grade level. The analysis results are given in Table 8. When the homogeneity of the variances was examined ($p = 0.21$), the variances were not meaningful, in other words, they showed a homogeneous distribution. As seen in Table 8, it is confirmed that the EFL attitudes are not different according to students' levels ($F(3, 63) = .47$, $p > .05$, $r = .14$). A post-hoc multiple comparison test was not used as there was no significant difference between the groups.

Table 8. Analysis results of EFL attitudes by grade levels

	Sum of Squares	*df*	Mean Square	*F*	*p*
Between Groups	.04	3	.01	.47	.70
Within Groups	1.96	60	.03		
Total	2.01	63			

4.4. The students' views on *DynEd*

The views of the students who used *DynEd* concerning the software were examined using descriptive statistics and the findings are presented in Table 7. When the average values of all items were examined, the values ranged from 1.02 to 1.36, meaning that the students had positive views favoring *DynEd*. The students stated that they liked to use *DynEd* ($M = 1.02$, $SD = 0.12$), that they learned something with this software ($M = 1.02$, $SD = 0.12$) and that it would be beneficial to use such software in other lessons ($M = 1.02$, $SD = 0.12$). The students stated that they generally did not have difficulty in using *DynEd* ($M = 1.36$, $SD = 0.48$); however, their response to this item ("*I did not have difficulty using this software*") appears to be closer to "No" than others.

Table 9. Students' views on *DynEd*

	Yes		No			
Items	*f*	*%*	*f*	*%*	*M*	*SD*
1. I liked using this software.	63	98.4	1	1.6	1.02	.12
2. I learned something about using this software.	63	98.4	1	1.6	1.02	.12
3. I think that these kinds of software will be useful in other lessons.	63	98.4	1	1.6	1.02	.12
4. I would like to use these kinds of software in my other courses.	59	92.2	5	7.8	1.08	.27
5. I did not have difficulty using this software.	41	64.1	23	35.9	1.36	.48

5. Discussion

In this study, the effect of *DynEd* on middle school students' language skills and attitudes towards learning English was investigated. The research was conducted with an ex-post facto design, and the change in language skills and attitudes of student groups using *DynEd* (n = 64) and not (n = 72) were examined. According to the results, it was seen that *DynEd* contributed to the language learning skills of middle school students and improved their attitudes towards language learning. However, students' attitudes towards learning English did not change according to gender and grade.

The results of past studies have emphasized that the usage of technology in the teaching process is more useful than conventional methods (Alvarez-Marinelli et al., 2016; Daskalovska,

2015; Kılıçkaya, 2015). It has been argued that technological environments that provide individual learning opportunities will make students more enthusiastic (Lai, Shum & Tian, 2016). The students were more enthusiastic and expected to be more successful when they use relevant environments. *DynEd* offers individual learning opportunities, helps students to adopt a relevant learning environment and increases their English language skills. The feedback provided by computer-based learning environments in the learning process also helps students to reduce spelling and writing errors (Chen, 2016; Chukharev-Hudilainen & Saricaoglu, 2016; Lawley, 2016; Shintani, 2016; Yeh, 2015). Furthermore, it can be argued that the use of video in similar environments can accelerate language learning, reading, and comprehension, and help in the effective pronunciation (Y.-H. Huang & Chuang, 2016; Hung & Higgins, 2016).

Research often focuses on language learning as a whole, whereas most studies focus on specific skills only. In a study on language learning, CALL was more effective than conventional teaching and it increased learners' pronunciation skills (Luo, 2016). Some studies have focused on listening and speaking skills, while listening and speaking skills in foreign languages may increase with the use of mobile technology (Hwang, Shih, Ma, Shadiev, & Chen, 2016; Z. Sun et al., 2017). Besides, the use of technology in language learning is supposed to accelerate writing skill acquisition and make language learning more enjoyable (Hwang, Chen, Shadiev, Huang & Chen, 2014). In the research related to the use of *DynEd* in language learning, conventional methods have been compared, and it has been concluded that *DynEd* increases students' levels of English learning and motivation (Baş & Kuzucu, 2009; Bulut-Özek & Pektaş, 2016). All these research results indicate that technology contributes to the development of language skills such as reading, writing, listening, speaking, pronunciation and spelling.

In our study, language skills were evaluated as a whole, and it was concluded that *DynEd* significantly affected EFL language skills (reading, writing and listening). Also, *DynEd* had a significant effect on EFL attitudes of middle school students and that the students had positive perception towards *DynEd*. It is seen that similar results are emphasized in the research conducted on *DynEd*. In this study, only the opinions of the students using *DynEd* are included. However, some studies have as well considered the opinions of teachers and pointed out that students' views on *DynEd* are generally more positive than the views of teachers (Ellsworth, 2015; Şengel et al., 2012; Yigit & Özgan, 2011). Similarly, in our study, most of the students also stated that they had no difficulty using *DynEd*. Baz and Tekdal (2014) argued that, unlike these results, qualifications of *DynEd* were partly sufficient for teachers, but students had ambivalent opinions about the software. In another study, the effect of *DynEd* on English

attitude was not significant but the software had a significant effect on language skills (Inal & Korkmaz, 2019). However, it is also noteworthy that the study was conducted with primary school students. On the other hand, it was emphasized that *DynEd* had no significant effect on the achievement of English courses because the software was not appropriate to the course content (Şengel et al., 2014). In contrast, J. Huang and Wu (2013) found that *DynEd* improved students' language skills, especially listening and speaking skills, but did not significantly affect writing and reading skills. Besides, Meri (2012) stated that *DynEd* had a positive impact on the autonomy of students. Furthermore, in a relatively recent study with university students, it was revealed that students adopted *DynEd* (Prastikawati, 2019). When these results are evaluated together with the results obtained in our study, it can be said that *DynEd* is generally welcomed by the students.

6. **Conclusion**

Increasing usage of technology in today's world, especially the use of computer technologies, has become widespread and has resulted in the incorporation of instructional technologies for educators to design more productive and effective teaching environments. Moreover, instructional technologies, which are also involved in language learning, have enabled the CALL method to be widely used in language learning. Many digital learning environments developed in this context continue to be used widely in language learning. In this study *DynEd*, one of such environments, has been investigated with the aim of determining its effect on language skills and attitudes of 136 middle school students. Besides, the opinions of the students using *DynEd* about this environment were also identified. As a result, it was found that *DynEd* had a significant positive effect on language skills of students. Another result obtained from the research was that *DynEd* significantly affects students' attitudes, making them positive towards EFL learning. However, *DynEd* did not cause a change in students' attitudes concerning the grade level and gender. In addition, the students using *DynEd* expressed positive views about *DynEd*. Moreover, the majority of the students stated that it was beneficial to use similar systems for other courses.

Based on the results obtained from this study, using *DynEd* as a learning tool in EFL teaching proves beneficial for middle school students. This study was designed with an ex-post facto research approach because intervention was not carried out. Therefore, the possibility that the students have experienced language learning (e.g., peer interaction, internet, video, social media, apps) outside of *DynEd* during the 8-week period can be considered as a limitation of our study. As a result, conducting experimental studies in the future with an intervention may

contribute to a clearer interpretation of the effect of *DynEd*. The fact that this study covers only one middle school is, obviously, another limitation. Therefore, conducting research covering more schools may contribute to the reliability of the findings and the quality of the existing literature. In addition, in new research, *DynEd* can be investigated with primary or high school samples.

Acknowledgement

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THE RELATIONSHIP BETWEEN READING STRATEGY USE AND READING COMPREHENSION AS MEDIATED BY READING RATE: THE CASE OF EYE MOVEMENT TRAINING BY RAPID SERIAL VISUAL PRESENTATION (RSVP)

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Abstract

The purpose of the current study was to examine the relationship between reading strategy use and reading comprehension as mediated by reading rate amongst advanced EFL students who received eye movement training by Rapid Visual Presentation (RSVP) technology. Seventy-two EFL learners participated in the study and received instruction for enhancing their reading speed via Reading Trainer Application for twelve consecutive weeks. Their entry-level of reading strategies awareness was assessed by the Metacognitive Awareness of Reading Strategies Inventory prior to and after the study. Their reading comprehension was assessed by International English System Test before and after the study. Their reading rate was also recorded prior to and after the study. Modelling the relationship between strategy use and reading comprehension as mediated by reading rate was tested prior to the study and the findings showed that the model was not statistically significant. The model was reassessed after the experiment and the results lent credence to the fact that eye training via RSVP for speed reading led to a mediating role for reading rate in the relationship between strategy use and reading comprehension. The results support the fact that reading rate is a contributory factor in understanding reading passages and integrating speed reading training using the-state-of-the-art technologies into reading instruction should be considered in EFL reading courses.

Keywords: RSVP; eye movement; reading; rate; comprehension; cognitive strategy; MALL

1. Introduction

The 21st-century is consistent with rapid developments in computer technologies as though it has received substantial attention in different branches of education (Korucu & Alkan, 2011). As lies the case with many other disciplines, language learning has delved into numerous

chances to boost pedagogy efficiency by integrating various sorts of technologies into the language classroom (Rahimi & Babaei, 2020).

Myriads of studies admit the importance of Technology-Enhanced Language Learning (TELL) as a means in language acquisition (Jarvis & Achilleos, 2013), and some research suggested that learners employing TELL surpassed the ones undergoing traditional training. (e.g., Constantinescu, 2007; Hoopingarner, 2009; Grgurovic, Chapelle & Shelley, 2013). Lately, the integration of mobile tools into education within and beyond the class walls is incrementally escalating at such an incredible pace that conducting investigations on its advantages and disadvantages in the academia has substantially gained in importance (Economides & Grousopoulou, 2009; Engel & Green, 2011).

Mobile learning (M-learning), a modern means to fill the absence of early distance learning systems (Korucu & Alkan, 2011), is defined as cooperative and technology-based learning in which learners are actively involved in motivating and real-world learning assignments through cooperating with portable devices, personal digital assistants (PDAs), and cellphones (Behera, 2013; Mehdipour & Zerehkafi, 2013; Ozuorcun & Tabak, 2012; Soleimani, Ismail & Mustaffa, 2014). In such a framework, mobile-assisted language learning (MALL), as a subcategory of M-learning and Computer-Assisted Language Learning (CALL), proposes a modern approach to language learning, assisted or boosted via the employment of compact cellphones, in which both traditional and distance learning are endorsed (Wang, 2004; Kukulska-Hulme, 2013).

Mobile technologies hold the vision of supporting foreign language learning and adding a greater extent of merit to education by progressively acquiring new users and providing increased capacity (Genc, 2012; Pachler et al., 2010). It is argued that "the future of language learning lies more with MALL and especially with pen assisted language learning (PALL) than with CALL" (Chaka, 2008, p. 539) owing to distinguishing features of MALL: "mobility, ubiquity, and connectivity; portability and handleability; convergence, multifunctionality, cross-platform blending, optionality, and convenience; access, accessibility, availability, and affordability; and context-awareness, personalization, and flexibility" (Chaka, 2008, p. 542). As a result, research on mobile-based emerging technologies in the domain of language teaching and learning is pivotal to gaining greater insight into the benefits of MALL environment for mastery of language skills. Especially, in this era where the appearance of different types of mobile apps claiming to help language learning is on the rise, language teachers and learners should be informed of their value by the scientific community.

Reading speed training apps designed with the aim of speeding up on-screen reading are among these aforementioned environments. While widespread use of mobile phones among language learners fuels the boom of app development, research on the effects of these apps on reading performance is lagging behind. A few studies in this filed have revealed mixed findings about the benefits of using reading training apps in improving reading comprehension and strategy use and awareness. As a result, this study aims to scrutinize the effects of a reading speed training app on EFL learners' development of reading comprehension and strategy use/awareness considering a mediating role for reading rate.

2. Literature review

2.1. Rapid Serial Visual Presentation (RSVP) Technology

As a ground-breaking invention, Rapid Serial Visual Presentation (RSVP) has the exclusive trait of displaying words (or at times, groups of words) set at a fixed pace and point (Forster, 1970). In RSVP, words are serially displayed at a time in order to lessen the eye movements and intensify the concentration while reading (Rahimi & Babaei, 2020). To put it differently,

> RSVP is the process of sequentially displaying images at the same spatial location at high presentation rates with multiple images per second, as an instance with a stimulus onset asynchrony no greater than 500ms but often lower than 100ms, i.e.,>10 stimuli presented per second (Lees, Dayan, Ceotto, McCullagh, Mahuire, Lotter & Coyle, 2018, p. 1).

RSVP technology is widely employed in pedagogy since it allows psycholinguists to manage exposure period of the stimuli and examine its impact on comprehension, recognition, and retention (Öquist & Goldstein, 2003). Thus, RSVP is proved to be an apposite means for accelerating pedagogical outcomes, typically in mainstream education and, more particularly, in language acquisition. It is postulated that factors such as text size, visual structure, segmentation unit, and presentation units are crucial factors that significantly condition retention in RSVP (Lemarié, Eyrolle & Cellier, 2008).

RSVP was previously deemed to be one of the experimental models used in the examination of attentional mechanisms integrated it into both the written language and comprehension process (Forster, 1970). Compared to regular reading, in which readers are required to dedicate plenty of time reading the words and take other factors such as the frequency, function, length, and position of the words into account, RSVP forces the readers to read the entire words within a text, incorporating the words missed or evaded in regular reading (Just & Carpenter, 1980).

Numerous facts confirm the supposition that RSVP can affect reading comprehension (e.g., Cocklin et al., 1984; Proaps & Bliss, 2014; Potter et al., 1980; Forster, 1970; Bouma & de Voogd, 1974; Masson, 1983; Benedetto et al., 2015; Just, Carpenter & Woolley, 1982). Many studies conducted on RSVP suggest that retention could be at an acceptable level and even more significant than or equal to regular reading. However, several contributory factors can negatively impact reading comprehension in RSVP. For instance, it is documented that reading comprehension substantially decreases when students quickly glimpse through each word for a brief period (like 85 ms - Just, Carpenter & Woolley, 1982). Furthermore, if the students are not allowed to pause at the end of every sentence, they fail to appropriately attend to the reading comprehension tests as though a significant decline would be noticeable in their performance (Benedetto et al., 2015).

2.2. RSVP and reading

From an educational perspective, teachers expect that their students become more capable readers. Based on verbal efficiency theory (Perfetti, 1985), the ability to read is attributed to reading speed and reading comprehension. Similarly, Grabe (1991) ascribes both apposite reading rate and retention ability to be the chief characteristics of fluent reading in language acquisition.

Several studies conclude that an ordinary L1 adept reader is capable of delivering virtually 250 to 300 words per minute (wpm), along with nearly 90 fixations per 100 words (Nation, 1997; Carver, 1982; Nation, 2009), while college students move the speed up a notch to roughly 300 wpm (Hunziker, 2006). Masson (1983) also estimated the maximal reading rate at about 800-900 wpm and reported that reading beyond these rates is impossible without skipping the words. However, it should be noted that the reading rate in either second or foreign language is considerably slower in comparison to the mother tongue (Droop & Verhoeven, 2003; Fraser, 2007).

It is also documented that fluency skills in reading "are directed at allowing the reader to see larger sentences and phrases as wholes, a process which assists in reading more quickly" (Hudson, 2007, p. 80). Fluency development is assumed as one of the chief four strands of a language course, and it is advised to dedicate roughly equal time to it in the curriculum (Nation, 2007). It is suggested that "speed-reading courses need to be incorporated as an essential part of all reading classes" (Chung & Nation, 2006, p. 198). Other than that, numerous researchers regard reading speed as a curriculum-based measurement, a valid and reliable procedure to

observe learners' advancement on a frequent basis and make instructional decisions (Tichá et al., 2009).

According to RSVP studies, it is perceived that determining the ultimate set of presentation parameters for RSVP is yet a reasonably challenging task (Proaps & Bliss, 2014). Myriads of studies reveal that readers can grasp the passage presented at a pace similar to the skim-reading technique, between 8 to 12 words every second (Potter, Kroll & Harris, 1980; Ward & McNamara, 1982; Masson, 1983). Similar to traditional text presentation formats, reading at a rate of 250 words per minute (wpm) (i.e., four words per second) may noticeably augment the performance (Proaps & Bliss, 2014).

RSVP technology allows learners to control their reading speed as though they can read the end of the text during the given time; this is moderately in marked contrast to traditional and time-based reading tasks in which some students may not be able to do during the given time (Rubin & Turano, 1992). Moreover, it is indicated that RSVP simulates visual experience of regular reading and eliminates the need for eye movement (Rayner, 1998). Moreover, the argument that the removal of eye movements would lessen the cognitive load, proposed by some researchers (e.g., Potter, 1984), is utterly rejected by many researchers (Castelhano & Muter, 2001) as RSVP may boost the cognitive load and occasionally divert the reader's focus and attention from the passage (Bouma & de Voogd, 1974).

Besides, it is documented that RSVP removes regressions and prevents learners from following the previously read parts of the text again, which, in turn, would affect the comprehension since regressions and rereading occur when readers face a problem while processing the linguistic sections of the text (Reichle, Rayner & Pollatsek, 2003). Nevertheless, regressions are not the only distinctive features between traditional reading and RSVP in such a way that a whole host of research studies demonstrate that during reading, accessing readers' knowledge and information starts primarily with words in advance of having them fixated via the parafoveal processing; additionally, the acquired information is later used to advance the processing just when the words are directly fixated (Rayner, 2009; Schotter et al., 2012). Monitoring the duration and sequence of word processing together with the oculomotor system is consequential for a clear comprehension of the text as if removing regressions endangers comprehension solemnly (Schotter, Tran & Rayner, 2014).

From a pedagogical perspective, conducting further studies on the topic seems to be essential as reviewing the literature postulates that an overwhelming majority of the research conducted in this area merely shed light on native-speaker subjects, ethnic groups, and cultural context or the differences observed between males and females; so the impact of RSVP on

EFL/ESL learners is admittedly scarce (Masson, 1983) especially within the MALL environment. Furthermore, while some scholars have paid conspicuous heed to the differences in reading comprehension and reading rate as a result of implementing RSVP technology, to the best knowledge of the authors, no study has focused on the mediating role of reading rate on the relationship between reading strategy awareness/use and reading comprehension thus far. Moreover, the current research surpasses prior studies on the grounds that it also entails examining eye-movement impact through RSVP technology on learners' awareness of reading strategies within the MALL environment.

3. Methodology

3.1. The aim of the study

It is evident in the literature that language learners' reading comprehension is under the influence of their reading strategy use and awareness. The role of reading rate in this equation has been found to be mixed, suggesting that in some educational contexts reading rate may hinder or counterbalance reading comprehension.

Research shows that this negative association can be influenced by incorporating suitable speed reading techniques into reading classes. Thus, it is possible to hypothesize that the relationship between reading strategy use and reading comprehension can be mediated by reading rate provided that the speed reading is integrated into a reading course where eye movement training is provided based on RSVP technology. In this way, the reading rate may function as a mediator that explains the underlying mechanism of the relationship between strategy use (IV) and reading comprehension (DV). The conceptual model of the study is displayed in Fig. 1.
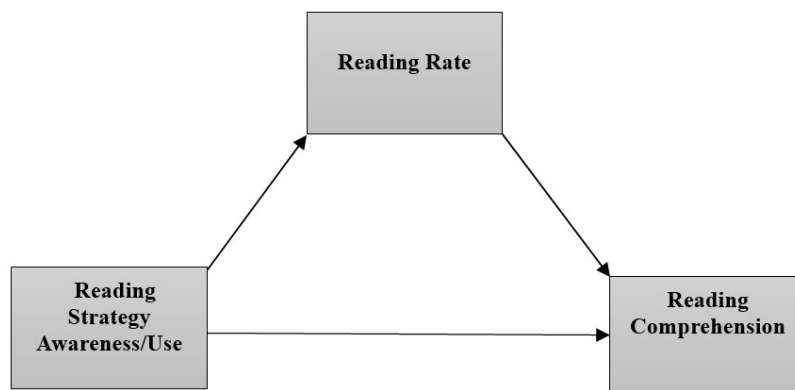
Figure 1. The conceptual model of the study

As a result, the current study seeks to answer the following research question:

1. Does reading rate function as a significant mediator between reading strategy awareness/use, and reading comprehension?

To answer this question, the study employed a one-group pre-test post-test experimental design to be able to examine the accuracy of the conceptual model of the study.

3.2. Participants and the context

Seventy-two advanced EFL learners who enrolled in two English courses in Fall 2019 participated in the study. The sample comprised both males (n=46) and females (n=26) within a range of 18-22 years old.

3.3. Data collection tools and procedures

The primary instruments employed in the study comprise the revised version of Metacognitive Awareness of Reading Strategies Inventory (MARSI-R), reading section of the International English System Test (IELTS) Academic Test along with Reading Trainer Application installed on the participants' smartphones. The detailed account of the research instruments is elaborated upon as follows:

3.3.1 MARSI-R

Metacognitive knowledge in reading is delineated as "the knowledge of the readers' cognition in the way of reading and the self-control mechanisms they exercise when monitoring and regulating text comprehension" (Mokhtari & Reichard, 2002, p. 49).

The renewed version of the Metacognitive Awareness of Reading Strategies Inventory (MARSI-R) (Mokhtari Dimitrov & Richards, 2018) was used to measure partakers' metacognitive awareness of reading strategies before and after the study. MARSI-R has been developed to replace the former Survey of Reading Strategies (SORS) questionnaire (Mokhtari & Sheorey, 2002). Considering the fact that "for students with advanced levels of English proficiency, either measure is fine to use" (Mokhtari et al., 2018, p. 239) and given the practicality issues, MARSI-R was elected to be implemented in the current research since the subjects were entirely proficient EFL students.

The MARSI-R is devised to scrutinize the students' metacognitive awareness in light of the tactics utilized during the reading process, particularly assessing three comprehensive

strategy sections, viz. Global Reading Strategies (GRS), Problem-Solving Strategies (PSS), and Support Reading Strategies (SRS).

Each section encompasses five items developed on the basis of a five-point Likert scale, ranging from 1= "not aware of the strategy at all" to 5= "fully aware of the strategy, and implementing it during the reading process". Average scores of 3.5 or higher signify a high level of awareness, while scores of 2.5 to 3.4 and 2.4 or lower imply a medium level of awareness and low level of awareness, respectively. The reliability of the scale was estimated using Cronbach's Alpha and found to be 0.78 and 0.70 for the pretest and posttest, respectively.

3.3.2. Reading Trainer Application (RTA)

RTA is a prize-winning application, scored 4.7/5 by over seventeen thousand individuals on both Play Store and App Store. Integrated with rapid serial visual presentation technology, it offers myriads of exercises and challenges to enable the readers to enhance their reading speed significantly and their retention and comprehension abilities concurrently. The built-in exercises concentrate upon warming up the eyes and training them in order that learners can boost their respective mental capacity to possess an improved extent of retention. At the outset, the application measures the users' reading rate, in words per minute (WPM), and comprehension level. Afterward, according to the statistics provided individually from each user, it starts suggesting the most properly adjusted series of units, comprised of various exercises, focusing upon enabling learners' mental capacities to cover the passages faster while maintaining the same or even better degree of comprehension by training the eyes to only see chunks of words while reading.

RTA's tasks are primarily divided into two groups, namely eye-brain-based training, and the exercises, requiring instant reaction and feedback from the learners. The software also provides a particular section, designed and inspired based on RSVP, called *Power Reader*. It offers different display modes, including centered words, highlighted lines, and fixation per row as a supplementary section. Moreover, this section allows the readers to determine their reading speed, adjust the difficulty level of the passages and even simply import their favorite texts into the application.

Last but not least, the software continually serves the users with charts and figures, reporting their progress, vicissitudes, and performance for further evaluation (HeKu IT GmbH, Reading Trainer, Play Store).

3.3.3. IELTS reading section

Reading part of the IELTS academic test, comprised of three sections and forty questions, with texts totaling approximately 2000 to 2750 words, was given to the participants for both pre-test and post-test. Further details on the IELTS academic reading test are illustrated in Table 1.

Table 1. IELTS Academic Reading Test

(https://takeielts.britishcouncil.org/take-ielts/prepare/test-format)

Format	The test comprises three long texts, ranging from the descriptive and factual to the discursive and analytical taken from journals, magazines, books, and newspapers, selected picked for a non-specialist audience but also suitable for people entering college courses or pursuing professional registration.
Timing	60 minutes including the transfer time
Number of Sections/ Questions	3 Sections (each section contains one long passage) 40 questions.
Task Types	Fill gaps in a passage of written text or a table, match headings to written text to diagrams or charts, complete sentences, give short answers to open questions, answer multiple-choice questions
Text Types	Texts range from the descriptive and factual to the discursive and analytical. Texts may encompass non-verbal materials such as diagrams, graphs, or illustrations. If texts contain technical terms, then a simple glossary is provided.
Marks	Each correct answer receives one mark. Scores out of 40 are converted to the IELTS 9-band scale. Scores are reported in whole and half bands.

The reliability coefficients of the tests were estimated using KR-21 and found to be 0.75 and 0.81 for the pretest and posttest, respectively.

3.3.4. Procedure

Seventy-two advanced EFL students were chosen, and their entry awareness of reading strategies, reading proficiency, and reading speed were examined before the study. Subsequently, they were familiarized with RTA and its functionalities. They were trained for 12 weeks in order to practice with the RSVP-based challenges inside the application. They were also asked to do additional exercises at home. After thoroughly concluding the required training, reinvestigation of the participants' awareness of reading comprehension, reading strategies, and reading speed was carried out. The findings were eventually examined, and the results were interpreted.

4. Findings and discussion

In order to assess the suggested model prior to the study when students had not taken any eye movement training with RSVP, simple mediation analysis was conducted using PROCESS v3.5 (Hayes, 2018). The statistical diagram of the model is shown in Fig 2.

Figure 2. The statistical diagram of the mediation model prior to the intervention

The model coefficients for data obtained before the intervention are reported in Table 1.

Table 1. Model coefficients for the model of the study (prior to the intervention)

Antecedent		**Consequent**						
		M (Reading Rate)				**Y (Reading Comprehension)**		
		Coeff.	SE	*p*		Coeff.	SE	p
X (Reading strategy)	a	3.279	4.538	.472	c'	-1.297	.940	.172
M (Reading Rate)		---	---	---	b	.161	.025	.000
Constant	i_M	133.795	16.382	.000	iy	3.912	4.813	.419
		R^2=.0080				R2=.386		
		F(1, 65)= .522 , *p*=.472				F(2, 64)= 20.181, *p*=.000		

Also, the result of total, direct and indirect effects of the model before the intervention are summarized in Table 2.

Table 2. Effects of reading strategy awareness/use on reading comprehension (prior to the intervention)

Total effect of X on Y					
Effect	**SE**	**t**	**p**	**LLCI**	**ULCI**
-.768	1.183	-.649	.518	-3.131	1.594
Direct effect of X on Y					
Effect	**SE**	**t**	**p**	**LLCI**	**ULCI**
-1.297	.940	-1.379	.172	-3.176	.581

Indirect effect of X on Y			
Effect	BootSE	BootLLCI	BootULCI
.528	.759	-1.082	1.966

As shown by the result of model estimation (Tables 1 and 2), reading rate does not mediate the relationship between reading strategy awareness/use and reading comprehension, considering 95% bootstrap confidence interval, when the students had not taken any eye movement training at the outset of the study.
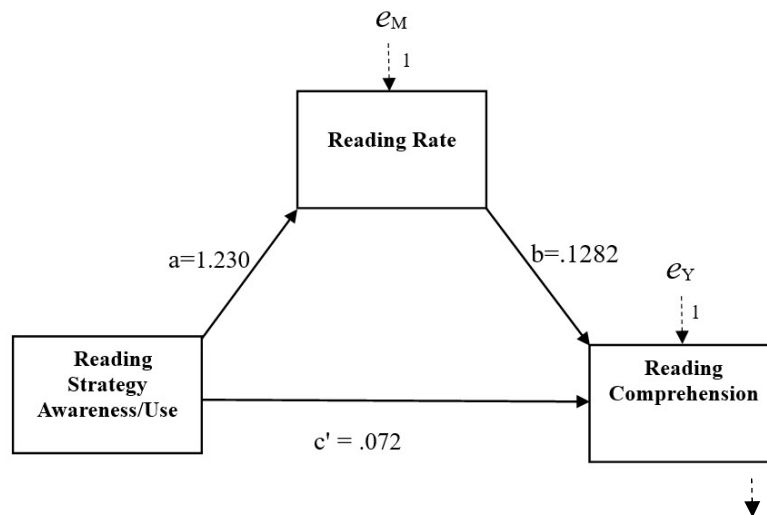
Figure 3. The statistical diagram of the mediation model after the intervention

After the intervention, the model was tested again. In order to assess the suggested model after the intervention (eye movement training to increase the reading rate) simple mediation analysis was conducted using PROCESS v3.5 (Hayes, 2018). The statistical diagram of the model is shown in Figure 3. The model coefficients for data obtained after the intervention are reported in Table 4.
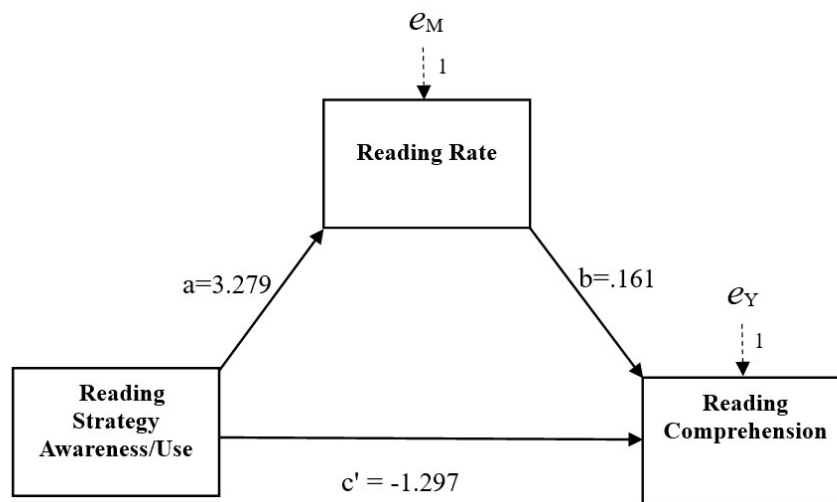
Table 4. Model coefficients for the model of the study (after the intervention)

Antecedent		Consequent						
		M (Reading Rate)				Y (Reading Comprehension)		
		Coeff.	SE	p		Coeff.	SE	p
X (Reading strategy)	a	1.230	.582	.038	c'	.072	.082	.383
M (Reading Rate)		---	---	---	b	.128	.016	.000
Constant	i_M	194.874	35.456	.000	iy	-9.928	5.826	.092
		R^2=.0080				R2=.502		
		F(1, 69)= .060 , p=.038				F(2, 68)= 34.359, p=.000		

Also, the result of total, direct and indirect effects of the model after the intervention are summarized in Table 5.

Table 5. Effects of reading strategy awareness/use on reading comprehension (after the intervention)

Total effect of X on Y					
Effect	SE	t	p	LLCI	ULCI
.230	.108	2.112	.0383	.0128	.447
Direct effect of X on Y					
Effect	SE	t	p	LLCI	ULCI
.072	.0824	.876	.383	-.0922	.236
Indirect effect of X on Y					
Effect	BootSE	BootLLCI	BootULCI		
.157	.076	.0281	.327		

As shown by the result of model estimation (Table 5), reading rate is a significant mediator of the relationship between reading strategy awareness/use and reading comprehension, considering 95% bootstrap confidence interval, after the students took eye movement training.

These findings suggest that reading rate plays a significant mediating role in the relationship between reading strategy use and reading comprehension when the readers are instructed by eye movement training. The positive value of reading rate suggests that EFL learners who read faster can process the text better and comprehend its message more accurately compared to those having a lower reading rate. It is worth noting that such a reading rate has been gained through the eye movement training received via RSVP technology implementation within the MALL environment.

At the outset, the findings of the study lend credence to the preliminary studies on the relationship between CALL and reading comprehension (Juola, Ward & McNamara, 1982) as innovative approaches to teaching reading would guarantee higher levels of strategy awareness/use and comprehension (Dreyer & Nel, 2003). The reason lies in the fact that technology-enhanced learning environments in general and MALL in particular promote motivation and sustained cognitive effort in doing difficult language tasks such as reading comprehension as "the most important obstacle to a sense of comprehension or satisfaction is an unwillingness to confront the input" (Bacon & Finnemann, 1990, p. 467).

It should also be noted that the interplay between motivation and cognitive effort would impact readers' attitudes towards and perceptions of language learning that would lead to management of cognitive load (Ozer & Kiliç, 2018). Type of instruction through MALL, technology-based instructional content, and the way the texts were read throughout eye movement training all led to less anxiety in comprehending the texts and as a result more time was spent on applying strategies. This is in stark contrast with mixed findings in the literature concerning cognitive load management in the RSVP learning environments (Bouma & de

Voogd, 1974); and supports the fact that the task load may decline as a result of the appropriate use of this technology (Castelhano & Muter, 2001) while attention is not deflected. Instead, *Reading Trainer Application* has helped bottom-up information processing and thus contributed to interactive reading where the gist of meaning is understood faster with more strategy use.

This finding is in agreement with what other researchers have suggested concerning the incorporation of apposite technological tools and applications into reading instruction that a higher degree of comprehension and employment of strategies would be guaranteed, as students' comprehension may be facilitated through graphic illustrations on the screen (Dreyer & Nel, 2003). Also, RSVP has tremendous potential for improving the reading skills of language learners with diverse characteristics, including age, language proficiency, and gender (Babaei & Rahimi, 2020).

Axiomatically, various facts corroborate the assumption that RSVP is capable of conditioning reading comprehension (e.g., Cocklin et al., 1984; Proaps & Bliss, 2014; Potter et al., 1980; Forster, 1970; Bouma & de Voogd, 1974; Masson, 1983; Benedetto et al., 2015; Just, Carpenter & Woolley, 1982). The findings accord closely with a number of other studies concerning the impact of RSVP on reading speed and reading comprehension. It is suggested that RSVP technology is capable of lowering the amount of time needed for planning or eye movement, which, in turn, induces a more effective reading comprehension process in a way that comprehension does not deteriorate at higher speeds (Boo & Conklin, 2015). This further supports the assumption that better reading skills may give rise to a diminution in the number of eye movements essential to process the written information (Hutzler & Wimmer, 2004). It has been postulated that natural eye movements are ineffective, the reason being that the readers tend to move their eyes in less insignificant forward saccades and more recurrent regressions than required in regular reading (Crowder, 1982). While employing RSVP, the reader's speed enhances since the reader will use the foveal region (the center of the visual field) to read the highlighted words at a given instant, which, in turn, augments concentration and eschews digressions that ultimately conduce to the more frequent deployment of support reading strategies (Beccue & Vila, 2004).

The findings of the study confirm what is reported by other researchers, revealing that efficient eye movement, as well as eye movement training, empower readers to foster their both reading skills (Dodick et al., 2017) and oral reading fluency (Allen, Beatty & Blanco, 2012). It also overshadows what was formerly found concerning RSVP's adverse effects in deploying reading strategies (Harmer, 1998).

In contrast, findings of the previous studies and findings of this research show no consistency regarding the claim that RSVP might arguably retard the reading rate as well as retention at particular paces (Benedetto et al., 2015; Chen & Chien, 2007; Potter, 1984). Also, it rejects the argument that reading rate in RSVP is not superior to traditional reading (Benedetto et al., 2015) or that comprehension is better in traditional reading compared to RSVP. What has been found here does not support previous research on RSVP claiming that improving reading speed via RSVP transpires at the expense of sacrificing comprehension (Potter et al., 1980; Just & Carpenter, 1980; Russell, James & Cohlmia, 2002)

As for the pedagogical implications of the current study, the findings are particularly of utmost significance for the following groups:

1. Language teachers can appositely adapt themselves with the class and accordingly opt for the best reading strategy following the students' reading and comprehension levels. Moreover, they can monitor and control their students' anxiety levels in different speed settings via their mobile phones and help them overcome their various weaknesses pertinent to both pace and retention while coping with reading comprehension tasks.

2. As for EFL learners, the utilization of both mobiles and modern technologies could lead to their further growth of interest and enthusiasm, exceptionally getting them engaged in educational activities performed during the class in consequence. They would also be capable of autonomously pursuing their educational goals, boosting their reading comprehension skill, and monitoring their respective progress.

3. Last but not least, the findings of this study would enable syllabus designers to integrate both MALL and CALL into the teaching arena during their programs so that language learners could enjoy the invaluable features offered by the contemporary technologies within their educational curriculum.

5. Conclusion

The current study is one of the pioneers in the arena of integrating RSVP technology and eye movement training into EFL classrooms, which aimed at examining the relationship between reading strategy awareness and reading comprehension mediated by reading rate within the MALL environment. The findings revealed that using *Reading Trainer Application* in reading instruction augmented learners' reading rate significantly, which, in turn, played a significant mediating role by empowering the students to process and grasp the text appreciably better. The findings attest that the integration of eye movement training into mobile phones via RSVP, as a

prominent device amongst language learners, is a preferable way to promote reading rate by enhancing learners' metacognitive awareness of reading strategies.

While the findings of the conducted study may yield far-reaching consequences for a wide range of scholars, language academics, and learners within the EFL realm, further research is warranted to cast new light on various aspects of RSVP technology within the MALL environment especially in terms of its efficiency in a variety of education systems in both private language institutes and schools. Also, more studies are required to be performed on the same topic through triangulating quantitative and qualitative data. Qualitative data can be collected by observation, interviews and think-aloud protocols to understand the underlying reasons why RSVP technology assists EFL learners' reading speed and strategy use. One line of research may also focus on using neuroscience-based tools such as electroencephalogram (EEG) or eye-tracking technology to monitor the readers' performance during reading to investigate the way they read paper or on-screen texts and analyze their eye movements more rigorously through the output data.

Acknowledgement

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STUDENTS' PERCEPTIONS OF THE INCORPORATION
OF FLIPPED LEARNING INTO L2 GRAMMAR LESSONS

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Abstract

The present study examined EFL learners' perceptions of using flipped learning procedure in a grammar class. The participants recruited were 60 Iranian intermediate male EFL learners, randomly assigned to an experimental and a control group. The learners in the control group, having no preparation prior to class, were given direct instruction by using whiteboard with no or little use of interactivities in their grammar lessons. The instruction in the experimental group, however, featured flipped learning through *WhatsApp* and was augmented through in-class face-to-face discussion. Online teaching as the pre-class preparatory activity grounded the learners in the formal instruction of new grammatical concepts. The in-class time was then used by the teacher to induce learner-centered, meaningful interaction intended to render better comprehension and retention of the target grammar. The data collection instruments were College and Universities Classroom Environment Inventory (CUCEI) and a semi-structured interview. The results revealed that the participants receiving flipped learning instruction found it satisfactory, engaging, and effective. The findings add further evidence to the existing literature on flipped learning and have implications for curriculum development and pedagogy enhancement.

Keywords: conventional classroom; flipped classroom; sociocultural theory of learning; students' perception

1. Introduction

Technology as a mediational tool for foreign language instruction has come under spotlight since the 1960s (Blake, 2008; Warschauer & Healey, 1998). The use of technology is traced to

the behaviorist perspective and the utilization of computers (Warschauer & Healey, 1998). With the rejection of the behavioristic approach in the late 1970s and early 1980s and the emergence of the socio-cognitive view, which supported the instruction in an authentic environment, frequent use of technology in broader contexts was further proposed (Warschauer & Healey, 1998; Kalin, 2012). Flipped learning instruction, as a result of this enhancement of technology use in education, emerged in 2007 as two chemistry teachers, Jonathan Bergmann and Aaron Sams, started recording their class lectures and posted them online for the students in an attempt to help them find access to the new concepts that they occasionally missed leaning. The success of the procedure motivated the two teachers to further make use of this strategy before their classes.

In a flipped classroom, the instruction is assigned to out-of-class knowledge delivery via video-based lectures and in-class knowledge application via interactivities. The out-of-class instructional videos familiarize learners with what they will be asked to do when they are assigned in-class collaborative or individual work to perform. A flip teacher tasks his/her learners with completing the designed assignments either by themselves or in groups in an attempt to trigger more engaged and independent learning. Thus, by blending technology for delivering new knowledge out of the class and working with the new concepts inside the class, the groundwork is laid for a more dynamic, interactive, and engaging learning environment compared to conventional classes (Chen Hsieh, Wu, & Marek, 2017). Adnan (2017) defined flipped learning as the reversal of the order of instruction by requiring students to perform preparatory work before attending the class and hence to free class time to be devoted to active learning activities and discussing the concepts at a deeper level.

Noteworthy, the success of a flipped classroom depends on gaining insight into what learners perceive concerning the teaching method. Learners' positive or negative perceptions coming from their experiences in flipped classrooms enable teachers to gain a deeper understanding about practices that are bound to be looked at (un)favorably. A user's intent in utilizing a technological tool is determined by what s/he perceives concerning the use of that particular technological tool and its ease-of-use (Davis, 1989). Gaining awareness of students' beliefs, expectations, objectives and their perception of learning strategies allows the instructors to shape meaningful and sensible learning for their students.

Although flipped learning has captured special attention, learners' perception of using flipped learning procedures is still in its infancy and the need for further researching the approach has been underscored by many scholars (Bishop & Verleger, 2013; Uzunboylu & Karagozlu, 2015; Betihavas et al., 2015; Gilboy et al., 2015). The flipped classroom

necessitates learners' autonomy and their commitment to pre-class preparatory work and in-class engagement with collaborative work. As opposed to second language learners who rely on their own independent learning, foreign language learners may not be fully able to detach themselves from their teacher when performing tasks. This makes them grow pre-accustomed to laid-back learning and rely on teachers' assistance rather than individually engage in problem-solving tasks (Wang, 2006). The practice also falls within the realm of the sociocultural theory (Vygotsky, 1978), which sees learners as self-adjusting their learning experiences through meaningful interaction and mediational tools as well as scaffolded feedback transpired in learners' Zone of Proximal Development (ZPD) (Lantolf & Throne, 2006).

In a flipped grammar classroom, situating the delivery of prerequisite knowledge out of classrooms through, for example, teacher-supplied video files, frees the in-class time for engagedly learning grammar and, thus, achieving higher language proficiency. Indeed, the utilization of instructional materials as an online activity augmented by in-class interactivities develop multiple situations by which a grammatical structure is better learned and retained. Relying on explicit learning via formal representation of new concepts cannot lead to effective use of grammar. Resultantly, grammar instruction should involve an online activity in an attempt to set up multiple situations through which further elucidation of a grammatical structure, like English conditional sentences, can take place. Therefore, inspired by the sociocultural theory, the present study aimed to examine Iranian EFL learners' perceptions of the incorporation of flipped classroom by addressing the following research questions:

1. How do Iranian intermediate EFL learners perceive social aspects of learning in flipped grammar classes?
2. Do Iranian intermediate EFL learners approve of flipped grammar classes?

2. Literature review

Flipped learning is depicted to have brought into effect a unique evolution of instructional approaches. In flipped learning, two learning contributors, namely lecture and active learning, are combined but are transposed in order to render an out-of-class teaching and an in-class interactivity. The lecture transitioning the basic knowledge grounds learners in and demonstrates expertise to them. Unlike conventional classes, this knowledge transition does not crowd the one-on-one interactions out of the group learning space and the in-class time is used for one-on-one interactions or active learning, which is defined as the process during which teachers keep students involved in some activities that propel them into deliberating on

ideas and how those ideas are applied (Michael, 2006). When lecture delivery is designated as a pre-class activity, then the learning process is begun with students' output and this procedure dovetails with what Wen (2008) argues in her 'Output-driven/Input-enabled model', according to which teachers must start their class with students' output. Proceduralizing instruction as such, according to the advocates of active learning (e.g. Bonnell & Eison; 1991; Hung, 2015; Meyers & Jones, 1993), can initiate higher-order mental processes such as decision-making, critical thinking, engagement, problem-solving and processing and can enable students to actively tie what they already know with what they need to learn by activities such as class and peer discussions through scaffolded instruction (Wette, 2015). In scaffolded instruction, the teacher or a more proficient student enables other students to do what they cannot do unaided and this ties up with what Vygotsky's Zone of Proximal Development (ZPD) theory states.

Through flipped classroom, 1) a more dynamic and flexible learning setting is encouraged and teachers empower their students to apply the concepts; 2) students can self-pace their learning and teachers leave in-class time to earmark it for active learning; 3) more opportunities open up to enable students to deepen and broaden the acquired concepts; and 5) students are more engaged in the learning materials and activities (Bergmann and Sams, 2012; Berrett, 2012; Moravec et al., 2010). When a conventional grammar classroom is flipped, the learning setting can prompt learners to play an active role in learning processes and results in better comprehension and higher language proficiency.

2.1. Theoretical framework of flipped learning

The study was conceptually structured around Vygotsky's (1978) socio-cultural theory. This framework examines how flipped learning promotes collaboration and effective utilization of classroom time, lending insight to see how students can surpass themselves and how they perceive flipped learning.

2.1.1. Sociocultural approach to learning

The sociocultural approach to learning is a theory that puts learning down to the socialization and situations with which a learner comes into contact. Greeno (1996) defined the approach as "the knowledge which is distributed among people and their surrounding environments" (p.12). This signifies that the sociocultural approach considers learners' physical and social surrounding for knowledge construction. Whatever objects, artefacts, tools, books and communities with which individuals interact are viewed as surrounding environments (John-Steiner & Mahn, 1996).

Social interactions in language classrooms, involving the interaction between the teacher and learners, as well as amongst the learners, generate language construction and use (Greeno, 1996; John-Stiener & Mahn, 1996; Vygotsky, 1978). Social interactions in language classrooms come out well through learners' interactivities like collaborative learning which calls for negotiations and feedback. The engagement in a dialogue causes the occurrence of a two-way task which involves both input and output needed to notice and hypothesize the interlanguage which contributes to second language development (Egi, 2010).

2.1.2. The Zone of Proximal Development (ZPD)

Learning does not take shape in vacuum or on one's own. The interaction essential to encourage learning is a pivotal factor to understand how effectively the sociocultural lens for learning works. This approach is well-supported by Vygotsky's (1978) concept of 'The Zone of Proximal Development', which highlights the role of a more competent other who offers support in a learning setting. The evaluation of progress involves the assistance that the learner is provided with by a more competent other to understand what goals a task pursues and how a task should come to a successful completion. The teacher should gradually disengage from the task and taper off the support so that the student can make progress and eventually bring the task to completion unaided. The flipped learning model has the teacher circulate around in the classroom to supervise students as they perform engaging activities and scaffold the learners who may flounder or misconceive a task (Gough, Grundmeyer, & Baron, 2015; O'Flaherty & Phillips, 2015).

2.1.3. Scaffolding

Scaffolding is a conceptual tool that explains the way teachers can support their students in learning activities and entails evaluating, giving feedback, and tapering off support (Wood, Bruner, & Ross, 1976). Scaffolding sees the teacher constantly mentor and evaluate students' understanding and progress on a given task and ensures that their interest for completing the task does not wane. The mentor can simplify the task by decreasing the amount of needed information or task requirements that the learner needs in order to finish the task (Wood, Bruner, & Ross, 1976).

In flipped learning, video lectures are viewed as scaffolding tools by which teachers can synopsize contents and narrow down a given subject. To do so, videos should be short and concise so that the amount of information presented to the students is reduced (Bergmann & Sams, 2012). As mentioned previously, a flipped classroom gives learners the opportunity to

have near and constant presence of their teacher who mentors them in the task completion and this is what on which scaffolding focuses (Wood, Bruner, & Ross, 1976; Pea, 2004). Another way of scaffolding in flipped learning is the one which mediates the flow of received information where scrolling enables students to control the amount of the received information when they interact with the videos (Gough, Grundmeyer, & Baron, 2015; O'Flaherty & Phillips, 2015).

2.2. Empirical research on flipped learning

Previous literature on student achievement indicates that flipped-taught learners outmatch their counterparts in conventional classrooms (Berrett, 2012; Huang & Hong, 2016; Leis, Cooke, & Tohei, 2015; Moraros, Islam, Yu, Banow, & Schindelka, 2015; Strayer, 2007, 2012; Warter & Dong, 2012). For example, flipping ninth-grade classes in Clintondale (MI) High School in 2010 reduced the failure rates by as much as 33 percentage points (Clintondale High School, 2013).

Moreover, students mainly appreciate this model of learning. Qualitative comments obtained out of studies denote that pre-watched videos and in-class peer-assisted problem solving make the most important contribution to students' approval with flipped courses (Bhagat et al., 2016; Schultz et al., 2014; Snyder et al., 2014; Clark, 2015). Flipped classroom learning atmosphere, having students self-pace, strategize and use their own learning techniques, culminates in an agreeable learning experience (Berrett, 2012). Such lessons, viewed as worthwhile and fruitful, cause the approach to be preferred over traditional lecture-based ones **(**Papadopoulos**,** Santiago-Roman, & Portela, 2010). In addition, the existing literature shows that flipped-taught students evince engagement which, according to Rutherford (2013), is derived from the fact that students' freedom and control over learning have risen.

Empowering students to take over their learning is another theme demonstrated in the literature. For example, Strayer (2012) surveyed the flipped- and conventionally-taught students to assess their perceptions of personalization, individualization, task orientation, innovation, student cohesion, collaboration, and equity of the learning atmosphere in actual and preferred learning environment. Students staked out the differences and the fact that conventional learning environment did not live up to their expectations. Regarding the effect of technology-mediated instruction on teacher and students' perception, the U.S. Department of Education (2010) conducted a meta-analysis and found that the use of technology brought

about significant improvement in reflection, comprehension, retention and perceptions of learning achievements. Thus, a mismatch between conventional classes and the way 21st century students learn and perceive success in the classrooms (Strayer, 2012) lend insight to the significance of taking account of student perceptions they hold about their learning experiences.

Although flipped learning has received increasing attention, learners' views on the approach need to be more rigorously studied (Bishop & Verleger, 2013; Uzunboylu & Karagozlu, 2015; Betihavas et al., 2015; Gilboy et al., 2015). In particular, the current literature points to the few published trails on the efficacy of flipped learning in EFL learners' communities (Soleimani, 2019). As a result, this scant literature necessitates more explorations regarding learners' perceptions and the efficacy of flipped classrooms to conclude if this approach is a breakthrough or a mere hype. The present study, motivated by such concerns, attempts to continue the line of research in this area in the EFL context of Iran.

3. Method

3.1. Participants

Sixty Iranian intermediate EFL learners, studying English at a private language institute in Isfahan, Iran, were selected through convenience sampling to participate in the study. They were all male and ranged in age between 15 and 25. The participants were randomly assigned to a control and an experimental group, each composed of 30 members. The control and experiment groups were each further divided into two sub-groups in order to form two flipped classes and two conventional classes, each containing 15 participants.

3.2. Instruments

The following instruments were used in the present study.

3.2.1. College and University Classroom Environment Inventory (CUCEI)

To examine the participants' perception of the course and learning environment of flipped classroom, College and University Classroom Environment Inventory (CUCEI) was used. The internal consistency of the 49-item instrument had been confirmed by previous researchers (Cronbach's α = .70 to .90; Fraser & Treagust, 1986; Strayer, 2012). To avoid any ambiguity and misunderstanding, the items were rendered into Persian, the participants' native

language. The face and construct validity of the questionnaire were also checked through expert judgment.

3.2.2. Semi-structured interview

To triangulate the data, a 10-to-15-minute semi-structured interview followed the CUCEI questionnaire to elicit students' perceptions of flipped language instruction. The validity of the interview questions was checked by four PhD holders in TEFL.

3.3. Procedures

Prior to the implementation of the flipped classroom, a pilot study was conducted to measure the reliability of the instruments. Then, the flipped grammar class, acting as the experimental group, received three sessions on conditional sentences which lasted for one and a half-hour each. The delivery of formal instruction of grammar through teacher-prepared videos was done. The videos, incorporating various instances of conditional forms, were uploaded the preceding day. The explanations of pre-, within-, and post-class activities are delineated below.

Pre-class: This stage, known as WOSQ ("Watching, Online discussing, Summarizing and Querying"), was used to help the teacher organize the teaching content and materials. It also enabled the researcher to effectively incentivize learners to watch the instructional videos, give feedback, text and share ideas and prepare for in-class discussions. To better understand the in-class knowledge contents, learners were engaged in preparatory pre-class work by watching the instructional videos, joining teacher-initiated online discussions, and writing a summary of what they learned at the end of the video which could be rewound, paused, and fast-forwarded to dispel any ambiguity, misunderstanding or difficulty. In addition to the summary, all learners were required to formulate three questions at the end of the video but were not allowed to confine themselves to just a 'yes' or 'no' answer. If the answer involved an initial yes/no, the learner was required to elaborate on the answer with an explanation.

Within-class: This phase had the learners practice during classroom hours. Having already received and watched a 5-10-minute online instruction, learners began with giving a summary of what they had acquired. Their summaries were followed by 20-minute teacher-led video-elicited questions about the uploaded online materials and remedial instruction. These questions, serving as a content review and recollection of the basic concepts of the lesson, paved the way for interactivity which took up the most in-class time. The flipped learning environment saw the teacher/researcher circulate around to monitor the learners' work and

clear up mistaken or hard-to-understand conceptions. The teacher masterminded and spearheaded learners' interaction and engagement in reciprocal interactive communications and group activities in order to apply the knowledge acquired from the video lectures. The 60-minute-spanned activities in the flipped-instructed classroom included resolving problems, working on projects, giving presentations, engaging in guided and independent practice, and taking quizzes.

Post-class: Drawing on what the in-class stage taught learners, learners were called on to develop a paragraph about themselves or other people and, particularly, ongoing issues. Then, they were required to upload their homework assignments so that their teacher and peers were able to feedback. The teacher either publically or individually explained to his learners some common problems whenever the need arose.

Following the three sessions of flipped learning, the participants who had not already experienced flipped classroom were given College and University Classroom Environment Inventory (CUCEI) to examine their perceptions of general issues in the flipped learning environment as well as teaching methodology. Moreover, the semi-structured interview was conducted with the participation of ten flipped-taught learners to express their perceptions of the effectiveness of flipped instruction qualitatively. The semi-structured interview sessions were audio-recorded for subsequent analysis.

Meanwhile, the instructor in the control group explained the target forms of conditional sentences through whiteboard and textbooks. Learners listened to the instructor's explanation and then did the grammar exercises in their textbooks. The instructor monitored students and provided them with feedback. In other words, no application of technology took place in the control group. In fact, the teacher attempted to direct the learners' attention to the conditional sentences both explicitly and implicitly in order to help them do the required tasks and take part in the classroom interaction and benefit from teacher and peer feedback. It should be noted that as opposed to the 60-minute time devoted to within-class activities in the experimental group (flipped classroom), the teacher in the control group had to lock himself mostly in lecture delivery and could only allot 20 minutes to within-class activities.

3.4. Data analysis

For the analysis of the CUCEI, the chi-square test was applied to inferentially ascertain the significance of the frequency of the learners' responses to the questionnaire and examine their perceptions of the quality of teaching methodology and learning achievement in a flipped classroom. As with the qualitative data of interview, grounded theory methodology, including

coding the data and ascertaining the emergence of the main categories in the learners' responses, was applied in order to reach insightful results and verify the learners' responses to the questionnaire employed in this study.

4. Results

The results of data analysis regarding the two research questions of the study are presented in below.

4.1. Learners' perception of social aspects of learning in flipped grammar classes

The first purpose of this descriptive study was to examine the learners' perception of the classroom learning environment affected by flipped grammar instruction. In doing so, College and University Classroom Environment Inventory (CUCEI) was used to investigate the effect of flipped learning environment on the students' engagement in the class and explore their perceptions in this regard. The CUCEI involves seven categories aimed at distinguishing the learners' satisfaction of the target learning environment. The seven items include personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, and individualization (Strayer, 2007, 2012). The description of each scale is provided in the Table 1.

Table 1. CUCEI item description

Item name	Description
personalization	The opportunities individual students have to interact with the instructor and the concern for students' personal welfare
involvement	How much students participate actively and attentively in class discussions and activities
student cohesiveness	Extent to which students know, help, and are friendly toward each other
satisfaction	How much students enjoy their classes
task orientation	Extent to which class activities are clear and well-organized
innovation	How often new and different teaching and learning activities are used
individualization	Extent to which students are allowed to make decisions and are treated differently

The descriptive statistics for CUCEI results are presented in Table 2.

Table 2. Descriptive statistics of the CUCEI

		N	Min.	Max.	Mean	Standard Deviation	Variance	Skewness	Kurtosis
1	personalization	30	3.10	3.70	3.41	0.188	0.035	0.076	-1.492
2	involvement	30	3.80	4.17	3.98	0.355	0.126	0.541	0.795
3	student cohesiveness	30	3.44	3.78	3.61	.097	0.009	0.981	0.696
4	satisfaction	30	3.98	4.00	3.99	.0154	0.024	0.024	-0.293
5	task orientation	30	3.33	3.70	3.51	0.107	0.011	0.011	0.309
6	innovation	30	3.24	3.22	3.21	0.012	0.021	0.032	0.221
7	individualization	30	3.50	3.85	3.67	0.135	0.101	0.010	0.124

Descriptive data in Table 2 reveals that the most mean score (M=3.98) was devoted to the learners' satisfaction of the flipped instruction, while the category of innovation had the least mean score (M=3.21). It seems that learners were satisfied with the learning environment of the flipped instruction in learning conditional sentences. In fact, learners' perceptions of the learning environment lie in their satisfaction of the flipped instruction in the learning of conditional sentences. In order to inferentially identify the significance of difference among the categories, normal distribution of learners' responses should be checked as in Table 3. For normality check, Kolmogorov Smirnov Test was used.

Table 3. Normal distribution of learners' responses to CUCEI items

		Statistics	Df	sig
1	personalization	0.218	30	0.020
2	involvement	0.355	30	0.000
3	student cohesiveness	0.326	30	0.030
4	satisfaction	0.362	30	0.000
5	task orientation	0.201	30	0.010
6	innovation	0.342	30	0.010
7	individualization	0.344	30	0.000

In order for the data to be normally distributed, p values should be more than .05. As to Table 3, it is inferred that p values are less than .05, which violates normal distribution of data, thus, leading to the application of non-parametric test to inferentially analyze the CUCEI. Hence, non-parametric Chi-Square Test was applied (see Table 4).

Table 4. Chi-square results for the difference among the CUCEI categories

	Flipped	Chi-Square	
	Mean	Df	Sig. (2-tailed)
1 personalization	3.41	30	.003
2 involvement	3.98	30	.000
3 student cohesiveness	3.61	30	.001
4 satisfaction	3.99	30	.000
5 task orientation	3.51	30	.020
6 innovation	3.21	30	.051
7 individualization	3.67	30	.001

Table 4 shows that there was a significant difference among the different categories of the learners' perceptions of the flipped learning environment. It can be inferred that significant difference was observed in the learners' satisfaction of the flipped learning environment (p=.000<.05) in comparison with the innovation category (p=.051>.05). It should also be noted that learners' perception regarding their involvement (p=.000<.05) and individualization (p=.001<.05) in the flipped-taught classroom learning environment was found to be significant.

4.2. Learners' approval of flipped grammar classes

The purpose of the second research question of the study was to explore the learners' approval of flipped learning compared to conventional classroom. For doing so, the grounded theory was applied to find the categories emerging in the learners' interview data. As regards the positive perception emerging out of the flipped classroom, the participants' perceptions can be categorized as 1) quality of grammar learning through flipped instruction and 2) learners' high motivation in flipped grammar instruction. The explanations of each category is provided in

the following and the learners' extracts of interview data are also presented to verify the categorization of learners' perceptions.

Quality of grammar learning through flipped instruction

The interview revealed that learners were satisfied with the flipped instruction since it paved the way to improve their learning and retention of conditional sentences. In fact, they held positive perceptions of the quality of grammar learning when they were exposed to flipped instruction. It appears that the flipped classroom made the learners aware of the use of conditional sentences practically. The interviewees indicated that they liked watching grammar videos at home since it prepared them for class. They could access the videos at any time. In this way, it helped them to form the basic knowledge about each grammatical rule before class. They also focused on the intensive practice of different types of in-class exercises. They liked it because it helped them evaluate their understanding of the grammatical rules. Moreover, the immediate feedback they used to get helped them understand the use, meaning, and function of different grammatical rules. There was a high level of motivation and participation during tasks which led to more learning. The extract below demonstrates the learner's satisfaction with the quality grammar learning achieved by flipped instruction.

> Extract 1.
>
> *I think that in our classroom everything was perfect. When we were working on WhatsApp and when we were discussing and feedbacking on the grammar tasks in the classroom. In my opinion, there was no extra activity to make the students boring. Conditional sentences, we could use them in the sentence and make a lot of sentences…it is very nice when learning grammar is in this way.*

Learners' high motivation in flipped grammar instruction

Since flipped classroom has been a rather different and new environment in interactive grammar learning, the learners' interview demonstrated their motivation in having more activities in such a learning environment. In fact, when a learning environment creates positive energy among the learners to play an active role in learning the target language skill, not only the learning process is facilitative, but it is also motivating for learners, which brings about a sort of competition among the learners in the classroom while learning the grammatical forms or any other language skill or sub-skill. Students indicated that they felt more motivated to participate in different grammatical tasks and more confident about their ability to answer grammatical questions. They also liked writing questions about the content of the videos because it helped them focus on the meaning of these rules. As *WhatsApp* and its mixture with

classroom setting have resulted in the learners' improvement in grammar learning, it seems that learners could self-regulate their own learning behaviors under the teacher's monitoring, which made learners to be highly motivated in learning conditional sentences. Moreover, they attributed their progress to the variety and significance of grammatical tasks and group work that caused them to engage in the tasks and better understand the meaning of different grammatical points. The following extract is a piece of evidence for such motivation.

> Extract 2.
>
> *I really like the time when teacher uses WhatsApp in teaching. You know… because this app is used in our daily communications, it is really interesting when we use in learning English. I really enjoy it. This causes me to be more active in discussions and it also help those students who are a little shy.*

To summarize, Iranian intermediate EFL learners' perceptions of flipped instruction lay in their reliance on the effective role of flipped teaching in creating an interactive learning environment for the learners to overcome their difficulties in learning. Analysis of the learners' responses to the questionnaire highlighted their satisfaction of the flipped learning environment and interactive involvement in such an environment with the teacher as well as the peers. The qualitative data obtained from the interviews also affirmed a positive picture of students' perception of flipped learning. Learners' interview revealed the learners' emphasis on the quality learning and their high motivation through exposure to flipped grammar instruction. The interview responses indicated the importance of videos, and pair and group work that helped students to learn in a fun and motivating environment. In addition, students' beliefs about the nature of grammar and its importance in communication changed as the focus was on the discussion of meaning of grammatical rules and their functions.

5. Discussion

The present study was conducted to qualitatively and quantitatively bridge the existing gaps in the literature concerning the efficacy of flipped instruction on the learners' perceptions of their grammar learning in the foreign language context. Data gathered from the CUCEI and interviews revealed that the flipped classroom apparently resulted in increasing the learners' satisfaction of the learning environment shaped through *WhatsApp* and face to face classroom since the learners strongly concurred that flipped classroom was productive enough to help them improve their knowledge of conditional tasks.

The findings support those of Freeman et al. (2014), who concluded that students improve when student-centered approaches like flipped learning are used. Additionally, the findings are in line with those obtained by McGivney-Burelle and Xue (2013), who reported that students can avail themselves of more opportunities to engage in purposeful activities. The positive impact of flipped teaching can be ascribed to the nature of the flipped classroom which induces more interaction and feedback between the teacher and learners. Thanks to its student-centeredness, flipped learning has the potential to make learners reflect on their learning behaviors and to consciously engage in target language tasks (Alsowat, 2016). The findings also corroborate those of Fulton (2012), who maintained that flipped learning can offer a thought-provoking learning setting in which learners can perform the learning tasks in a more creative manner, as well as those of Musallam (2010), who supported flipped learning and its role in providing language learners with a rich learning setting in which they can cooperatively do a part in a learning environment. Noteworthy, as stated by Amiryousefi (2017), watching videos at home can generate a non-threatening atmosphere which helps learners construct and increase their knowledge while eliminating psychological barriers.

Similarly, the interview findings, revealing that learners believed in the occurrence of quality learning as created by the flipped classroom, were aligned with research studies done by Clark (2015) and Sezer (2010), encouraging teachers to take advantage of incorporating technology into face to face learning and simultaneously achieving the learners' success in doing the target language tasks. Learners' high motivation in the flipped learning environment was also uncovered among their interviews, confirming the fact that learners' grammar learning and their successful interaction with their peers and the teacher, which took place through the flipped learning, could positively affect learners' perceptions of the use of flipped learning (Strayer, 2007, 2012).

The finding that the learners in the present research appreciated the flipped classroom compared to a conventional classroom, which seemed to be far from interaction-based grammar learning, can be atttributed to the fact that flipped-taught learners were not merely exposed to linguistic rules providing little-to-no chance for cooperative learning classroom. In fact, as argued by Bergmann and Sams (2012) and Berrett (2012), students buy into flipped classroom as students in this study wholeheartedly expressed their satisfaction of the flipped classroom using productive technologies, like *WhatsApp*, to gain mastery over grammar tasks. By providing an interactive learning atmosphere, learners could own the conditional tasks since they benefitted from teacher and peer support, which is in alignment with Bergmann and

Sams (2013) and Rutherford (2013), who strongly insisted on the positive application of flipped instruction in bringing about cooperative learning.

Last but not least, qualitative analysis of the interview data mirrored the findings of CUCEI. In fact, it was found that flipped learning could lead to learners' satisfaction with the learning environment. More importantly, the learners' involvement and cohesiveness were found to be significantly highlighted in the questionnaire. This provides another convincing evidence regarding the beneficial employment of flipped instruction in EFL and ESL classes since learners are seemingly exposed to an interactive learning environment (Bhagat et al., 2016; Schultz et al., 2014), assisting them to be consciously involved in the provided tasks and consequently self-regulate their learning behaviors (Vygotsky, 1978).

6. Conclusion

In sum, the present study was an attempt to direct the teachers' attention, particularly the EFL ones, toward possible advantages of flipped instruction in paving the way for themselves as facilitators, and their learners as the receivers, to feel independent in the classroom and enjoy the spontaneous interaction that occurs during the flipped learning model, which results in the 'possession' of the classroom by both parties. Giving language learners a chance to use videos brings about motivation and individual attention that students need to enhance their grammatical performance. In addition, self-learning enables language learners to further tap into peer-assisted learning, student-teacher interaction, and taper off their dependency on the teacher. This study necessitates more teacher education research to hold various pedagogic programs to raise teachers' awareness of quality teaching and learning through flipped instruction and probably other technology-related instructional approaches.

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MAKING VIRTUAL REALITY
ACCESSIBLE FOR LANGUAGE LEARNING:
APPLYING THE VR APPLICATION ANALYSIS FRAMEWORK

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Abstract

Virtual Reality (VR) is a valuable tool for learning, however, there is a lack of education-focused content for language learning needs. This article introduces the *VR Application Analysis Framework* (Lege, Bonner, Frazier, & Pascucci, 2020) to assist educators in scaffolding existing commercial off-the-shelf (COTS) applications for use in classroom activities through four key lenses: *immersive capacity*, *cognitive load*, *purpose*, and *communicative capability*. The framework is then used to analyze the strengths and weaknesses of an example COTS VR application, *Tilt Brush*. This analysis, completed using the framework, is followed by three lesson plans for *Tilt Brush* that demonstrate how VR could be used in the language classroom.

Keywords: virtual reality; VR Application Analysis Framework; immersive capacity; communicative capability; CALL; *Tilt Brush*

1. Introduction

Virtual reality (VR) has rapidly become more affordable and easier to use in recent years, making it both accessible and obtainable for average consumers. VR can also be found in increasingly varied contexts, including educational fields such as science, engineering, and even language learning. Particularly for language teaching, it is difficult to employ novel technologies effectively while also meeting the pedagogical needs of the classroom. To use VR successfully to meet language learning outcomes, there are many aspects related to hardware, software, and task design that need to be carefully considered. While there is an abundance of

commercial off-the-shelf (COTS) VR experiences, there is a lack of purpose-built educational applications. To use these COTS applications effectively, the *VR Application Analysis Framework* (Lege, Bonner, Frazier, & Pascucci, 2020) was devised to analyze them for language classroom activity use. This article reviews the four key aspects of the framework: *immersive capacity*, *cognitive load*, *purpose*, and *communicative capability*. The framework is then applied to an example COTS VR application, detailing how the application was analyzed. Finally, a focused activity will be suggested that aims to successfully apply a VR application to the needs of the language classroom.

2. Framework: Four Lenses

Scaffolding VR technology is necessary for its implementation into classroom tasks while meeting pedagogical outcomes. As Mercado (2017) notes, "technology is but a means to an end and should be chosen and used carefully if it is to truly help our learners reach their fullest potential in learning a second language" (p. 20). VR applications are no exception to this rule and must be carefully considered before classroom use. Bearing that in mind, the *VR Application Analysis Framework* is based on foundational literature from different disciplines within language teaching, including gaming for language learning, technology-assisted language learning, task design, cognitive load, media literacy, and more. The framework needs to not only look at the unique aspects of the technology, but also consider language learners' experiences both in VR and for parts of instruction not using VR. Ultimately, the framework is divided into four distinct methods of inspecting VR applications to ensure that proper analysis is completed before introducing VR into a language learning environment. Hereafter, these methods are referred to as lenses, as they allow instructors to view specific aspects of the applications for analysis. These lenses are *immersive capacity, cognitive load, purpose,* and *communicative capability*.

Figure 1: The *VR Application Analysis Framework* (Lege, Bonner, Frazier, & Pascucci, 2020, p. 28)
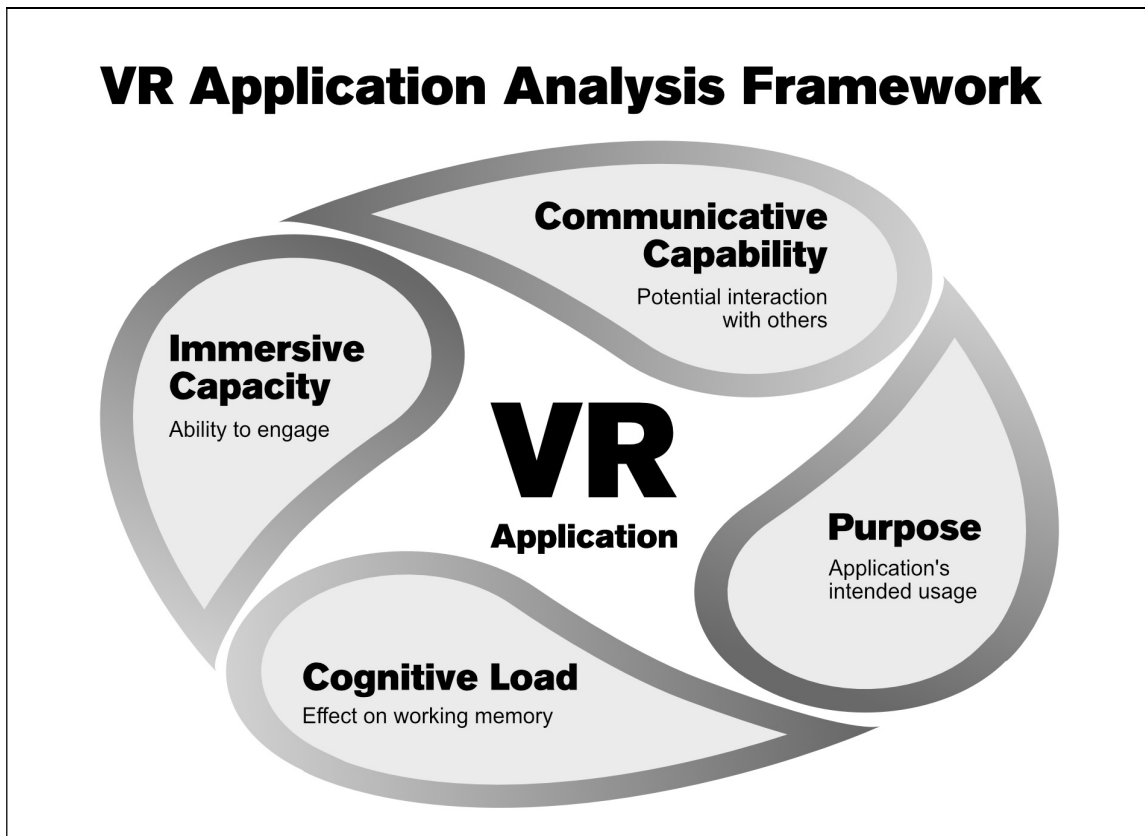
Note: The *VR Application Analysis Framework*. Reprinted from *New Technological Applications for Foreign and Second Language Learning and Teaching* (p. 28), by M. Kruk & M. Peterson, 2020. IGI Global. Copyright 2020 by IGI Global. Reprinted with permission.

2.1. *Immersive Capacity*

One of the most unique features of VR is the ability to create a sense of presence, "the (psychological) sense of being in the virtual environment" (Slater & Wilbur, 1997, p. 604). This means that learners may experience mental and physical immersion leading to engrossing experiences that makes them feel as if they are in a different physical environment. The framework divides *immersive capacity* into three categories: high, medium, and low. VR experiences with high immersive capacity allow users to move about freely within defined boundaries while mirroring their movements in the virtual world through hand and head tracking systems. Highly immersive applications do not necessarily have to be photorealistic to be immersive. Some of the most popular and immersive VR applications use a consistent and well thought-out application of low-polygon or cartoon-like environments. The nature of the experience is the most important factor in determining its immersive quality. Passive VR experiences do not allow for locomotion or interaction in the environment, so they tend to have

low immersive capacity. These experiences often consist of 360-degree videos or applications that only allow interaction through tracking gaze and head rotation. If an application contains elements of both high and low capacity then it would be classified as having medium immersive capacity.

Key questions about immersive capacity:

- How does the user experience and interact with the virtual environment? Can they move freely within the space using their own body, or are they limited to using head movements and controllers to navigate?

- Are there elements of the virtual environment that pull the user out of the experience?

- Can the user naturally manipulate objects within the virtual environment or is the environment static?

2.2. *Cognitive Load*

Immersive VR can be a very sensory-rich experience. The combination of detailed 3D environments, spatial audio, and realistic environmental navigation and interaction can create some unique challenges for users. Parong and Mayer (2018) note that "immersive VR may create so much extraneous cognitive processing that the learner does not have sufficient cognitive resources left to learn the essential material in the lesson" (p. 795). For language learners this may be further compounded, as language processing is added to the already lengthy list of factors that use mental resources. Hence, while working with VR for language education, it is important to consider the degree to which mental resources are being allocated for a VR learning activity. Cognitive Load Theory (Sweller, 1988; Sweller, 1994) suggests that when designing a learning experience, the limits of working memory are both recognized and designed for. Cognitive load can be categorized into three distinct types: *intrinsic*, *extraneous*, and *germane* (Chandler & Sweller, 1991). Intrinsic load refers to the embedded difficulty of the content itself, which may be either linguistic, subject-related, or concerned with how the user interacts with the virtual world. The other types, extraneous and germane, deal with task design and the integration of background knowledge into activities, which can be handled with careful effort on the part of the teacher.

The framework divides cognitive load into three categories: high, medium, and low. High cognitive load applications are normally classified by time constraints placed on the user. Often applications present users with instructions quickly and without a chance to review them. This can lead to failure if the user did not understand the instructions quickly enough. This can overwhelm working memory, especially for second language learners if the content is

unfamiliar and the language is too difficult. Additionally, if the application interface is not intuitively designed, this can put extra stress on the user's working memory. Furthermore, applications with multiplayer capability often can be characterized as having high cognitive load as interaction between players can be unpredictable. Applications with low cognitive load are generally self-paced, passive experiences with little to no pressure or constraints from the VR application or other users. A user of these applications effectively determines how much working memory they will apply to each experience. VR applications that fall into the medium cognitive load category possess elements from both high and low cognitive load.

Key questions about cognitive load:

- What cognitive burden is the VR application placing on learners? To what degree are cognitive resources being used by the interactional methods, linguistic components, or audio-visual elements?

- What can be done to lessen the load on students? How can educators scaffold the activity or provide better instructions?

- What can be done to help students build schema and automate processes before engaging in the VR learning experience?

2.3. *Purpose*

Purpose, as defined by the framework, refers to the genre of the VR application. Each genre has the ability to address certain aspects of the real world and is limited by the restrictions of the genre itself (Feez, Iedema, & White, 2008, p. 52). Applications are designed with a purpose in mind and an intended use case that is the basis for how the application will be used. The utilization of the application may differ from the developers' initial intent. For example, physical therapists have used the popular rhythm game*, Beat Saber* (*Beat Games*), designed for entertainment, to help patients do exercise outside clinical settings (Torres, 2017). Accordingly, the framework identifies four overarching purposes: *entertain*, *inform*, *communicate*, and *design*. These are not rigid classifications and may be mixed or combined. VR applications with the purpose to *entertain* are the most widely available COTS VR applications. These range from video consumption platforms to a wide variety of games and may require differing degrees of mental and physical agility. VR applications designed for learning would fall within the purpose of *inform*. These applications allow users to discover new knowledge and often consist of experiences in museums or different geographical locations that learners would not have the opportunity to visit otherwise. Online social experiences and chat applications are clear examples of applications designed for the purpose of *communicate*. Finally, applications

with the purpose of *design* grant users creative freedom without pressure; these could be used for not only making art, but other creative activities such as mind mapping, visually organizing linked ideas or information.

Key questions about purpose:

- What was the intended purpose of the VR application?
- How can the identified purpose of the VR application be adapted for language learning?

2.4. *Communicative Capability*

Communicative capability refers to the ability to communicate and interact with other users using built-in application features. Built-in features include but are not limited to synchronous voice chat, text messages, emotes, and gesture-based communication. Additionally, there may be some aspects of the application design that VR users can use to communicate with people in their immediate, real-world environments. Elements of the application, including pacing and linguistic complexity, may either permit or discourage communication with others in the immediate environment. Considering both the built-in features and the ability to communicate directly; the framework divides the communicative capability into three categories: high, medium, and low. Most often, applications with high communicative capability feature multiple modes of communication such as synchronous voice chat, emotes, or gesture-based movements. Applications with low communicative capability lack the ability to communicate with other players and are often designed as single-user experiences. Applications with a mix of high and low communicative capability would be considered as medium.

Key questions about communicative capability:

- What built-in features does the application have to aid communication?
- Apart from the application's built-in communicative features, what opportunities does the application provide for people who share the same real-world space to communicate?

3. Applying the framework: *Tilt Brush*

Tilt Brush (*Google*, 2016. Found at https://www.tiltbrush.com/) is a VR artistic design application available on all current VR platforms including *Oculus*, *SteamVR,* and *Windows Mixed Reality*. *Tilt Brush* is a 3D-painting experience wherein users access a plethora of shapes, colors and tools via a virtual palette accessible in one hand and paint with a virtual brush in the other. By walking physically around a space painting brush strokes into the air, artists can

create 3D art of any scope and scale. These creations can be shared online then downloaded and edited by anyone in their own Tilt Brush environments.

Through the four lenses of the *VR Application Analysis Framework*, it is possible to see how Tilt Brush can be applied in language learning classroom activities (see Figure 2).

Figure 2: Analysis of Tilt Brush through the four lenses of the *VR Application Analysis Framework*

Purpose				Immersive Capacity		
Entertain	Inform	Comm.	Design	Low	Mid	High
Cognitive Load				Communication Capability		
Low	Mid		High	Low	Mid	High

Applications with a *purpose* of design usually do not have any extrinsic goals or overt objectives and instead focus on giving users the freedom to create with the provided tools. *Tilt Brush* clearly falls into this category, as users simply select a brush style, a color, and start painting into the space. This is achieved without any instructions or limits concerning what the user creates or how they go about creating it.

For its *immersive capacity*, *Tilt Brush* features a high level of immersion. The user's dominant hand holds the brush, while the other holds the virtual palette. The palette contains access to all tools and menu options, providing a control scheme that closely mimics the same creation process of a real-world artist, despite the lack of an overt user interface. This allows users to quickly become accustomed to painting in a natural and intuitive fashion. Movement within the space is achieved through natural body movements rather than through joystick controls, reducing the likelihood of causing discomfort and lowering immersion.

The *cognitive load* would be considered *low* as *Tilt Brush* focuses on providing a simple, intuitive interface and environment. A low germane load is achieved through the recognition of natural hand movements and gestures to paint within the space. The application also does not impose any time constraints, instructions, goals, or other limitations on the user and allows them to commit as many or as few cognitive resources to the creative experience as they desire.

Finally, *Tilt Brush* also has a low *communicative capability* as it is a single player experience with no real-time communicative features. The only communication possible

between users is through the sharing of their creations via an online repository of submitted art works. Users cannot meet, talk, and work together within the space at the same time, but they can modify the works of others and resubmit them to the repository as a reinterpretation of their work.

4. Example classroom activities using *Tilt Brush*

There are many practical ways that a creative application such as *Tilt Brush* (see Figure 3) can be used in a classroom activity. The following examples demonstrate some activities involving high school or college students in a typical second-language acquisition course. For activities involving VR equipment, it is vital to provide orientation for students prior to the activity so that they are already familiar with the equipment and requirements for the safe use of VR in a classroom setting. This includes demonstrating safe navigation of virtual spaces, VR equipment sanitation between uses, and personal space awareness. Some of these activities can be undertaken with only one VR headset, while others would benefit from one VR headset per group.

Figure 3: Image taken from Google's *Tilt Brush* promotional video
(https://www.youtube.com/watch?v=TckqNdrdbgk)

Tilt Brush Activity One: Presenting Visual Summaries of Narrative Fables

Target Level: Intermediate/upper-intermediate (A2-B2)

Time: Two 90-minute sessions

Aims: Students will practice analyzing and summarizing written narratives, creating a visual summary, and developing presentation skills

Resources/materials: Short narrative story, paper for storyboarding, VR headset, *Tilt Brush* app, projector for streaming

Possible problems: Activity is possible with only one headset, but more VR headsets are recommended to reduce activity length, difficulty streaming the VR content to the projector if WiFi signal is weak

Procedure: This example is a reading and writing activity analyzing a fable and creating a summary of its narrative structure visually. The activity focuses on providing students with an opportunity to demonstrate their understanding of the topic through construction of their own visual summaries and providing verbal tours to their classmates.

Stages:

1. Students are given a fable to read, highlighting the most important narrative moments of the story.
2. Students write down the key points of the story and summarize its contents.
3. Students are divided into small groups and assigned a part of the fable. They are asked to sketch a storyboard on paper, describing visually what happens during their assigned part.
4. Based on their storyboard, students discuss what kind of artistic 3D creation they wish to create and divide up the work.
5. Students take a turn entering the VR *Tilt Brush* environment and recreate their scene from the fable.
6. Once the class has finished their creations, each group presents their scenes to the class with one member in VR streaming their art to a screen for the class to view, while the other members explain their scene and design choices.
7. During each presentation, the class is encouraged to take notes on each scene and a quiz can be administered later to check student recollection of the key moments of the fable studied in class.

Tilt Brush Activity Two: Descriptive Language Practice via Virtual Dioramas

Target Level: Intermediate/upper-intermediate (A2-B2)

Time: 90 minutes

Aims: Students practice using descriptive language such as adverbs of place, prepositional phrases, and adjective phrases

Resources/materials: List of descriptive language / prepositional phrases, 3D model, printed imagines of detailed scene, VR headset, *Tilt Brush app*

Possible problems: Limited number of headsets available for groups, finding a detailed model for use in the activity

Procedure: The following example is an activity to improve students' ability to utilize prepositional phrases and descriptive language. The activity is split into two 45-minute sections.

Stages:

Part 1 (45 minutes)

1. Teacher distributes paper handouts with a picture of a room with many objects.
2. Students practice describing the picture and the objects depicted therein.
3. Teacher reviews prepositional phrases and adverbs of place used for describing the picture by displaying the picture on a projector and asking students to describe the location of specific objects. Teacher writes elicited responses with prepositional phrases on the board.
4. Teacher divides the students into pairs or small groups of 3-4 and distributes one VR headset to each group.
5. One student from each group puts on the headset and opens *Tilt Brush*. The student opens the prepared 3D model.
6. The student describes the position of objects in the model using the phrases and language discussed previously. At the same time, members of the non-VR group write down the phrases.
7. Students change roles and add more phrases to their list until they have the target total (for example, 10).
8. Teacher monitors and assists the students with the correctness of the phrases

Part 2 (45 minutes)

1. Students remove the VR headsets, and set them aside.
2. Teacher demonstrates how to make a change to a scene in VR or shows a screenshot showing the process of editing existing 3D creations.

3. One member of each group puts on the VR headset and makes 5 additions or changes to the model.

4. After this is complete, the student takes off the headset and passes it to other members of the group. The students then search for and describe the 5 changes that have been made.

5. This process can be repeated as many times as necessary.

Tilt Brush Activity Three: Using Virtual Memory Palaces to Memorize Vocabulary

Target Level: Intermediate/upper-intermediate (A2-B2)

Time: 90 minutes

Aims: Students use VR to help visualize challenging vocabulary to aid with comprehension and retention

Resources/materials: List phrases/vocabulary, one VR headset per group, *Tilt Brush* app

Possible problems: One headset per group is required for this activity, vocabulary needs to be in some way represented visually.

Procedure: VR has been proven effective for improving spatial memory (see Pollard et al., 2020). This activity leverages this strength of VR by having students create virtual *memory palaces* to aid in vocabulary recall.

Stages:

1. Students are placed into groups and assigned a list of 10 vocabulary words.

2. Students take a few moments to check the definitions of the words and brainstorm ideas for how they can be visually represented.

3. One student enters VR, opens the *Tilt Brush* app and creates a new empty art scene. They then create a floorplan of the classroom in *Tilt Brush*. The students should be encouraged to add some objects to the room so that it mimics the real classroom as much as possible.

    It's important for the floorplan to be based on a space that every student knows the layout of. Refer to Krokos, Plaisant, & Varshney (2019) for more detail.

4. Once the space has been created, and ideas brainstormed for visual representations of the vocabulary, students enter VR one by one and add their creations to the room, remembering to write the vocabulary word under each creation. Other students can provide advice via streaming the VR experience on a smartphone or tablet.

    E.g., if the class is studying advertising, then the following objects could be used to represent key vocabulary visually in VR:

     i.   Brand - A *McDonald's* logo

     ii.   Catchy - A baseball mitt and a musical symbol

     iii.   Endorsement - A thumbs up at *Starbucks* logo with money next to it

     iv.   Viral - Many *Twitter* logos grouped together

5. After the memory palace is complete, each student reenters *Tilt Brush* to remember each vocabulary representation and its location within the virtual classroom.

6. Students take off the VR headset and then attempt to recall all the vocabulary words.

7. Teachers can then quiz students on the vocabulary in the following lesson to check retention.

5. Conclusion

VR is a powerful tool that can be used to enhance language learning experiences. However, there still remains a distinct need for more education-focused VR applications. Despite the lack of purpose-built applications, there is a wealth of commercial off-the-shelf experiences that can be taken advantage of until more specific educational content becomes available. Identifying and adapting these applications to fit the pedagogical needs of educators can be tedious and difficult.

With this in mind, by applying the *VR Application Analysis Framework* to existing applications it is possible to determine which aspects of an application need to be scaffolded for the language classroom. By analyzing an application through the four lenses, *immersive capacity, cognitive load, purpose,* and *communicative capability,* it is possible to create materials and activities to make VR accessible to any classroom. With this framework, teachers can have the confidence to apply VR to their classroom rather than continue to wait for relevant educational content to be created. As more teachers look to VR to redefine their language learning classroom activities, this framework will contribute to the body of research that aids in positioning VR as a commonplace tool for language learning.

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Other commercial off-the-shelf applications for classroom activities

The following are a list of other commercial off-the-shelf VR applications that have the potential to be applied successfully in classroom activities:

- *Anne Frank House VR* (Force Field, 2018, https://forcefieldxr.com/project/anne-frank/)
- *Job Simulator* (Owlchemy Labs, 2016, https://jobsimulatorgame.com/)
- *National Geographic Explore VR* (Force Field, 2019, https://forcefieldxr.com/project/natgeoexplorevr/)
- *Notes on Blindness* (Novelab, 2016, https://www.arte.tv/sites/webproductions/en/notes-on-blindness/)
- *Puppet Fever* (Coastalbyte Games, 2019, https://www.puppetfever.com/)
- *Rec Room* (Rec Room Inc, 2016, https://recroom.com/)
- *Spotlight Stories* (Google, 2016, https://atap.google.com/spotlight-stories/)
- *Traveling While Black* (Felix & Paul Studios, 2019, https://www.felixandpaul.com/?travelingwhileblack)

VOLUME 21, ISSUE 1
SPECIAL ANNIVERSARY ISSUE
20 YEARS OF TEACHING ENGLISH WITH TECHNOLOGY

Teaching English with Technology

January -2021