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DIPARTIMENTO DI SCIENZE DELLA FORMAZIONE E  
PSICOLOGIA***

**Dottorato Di Ricerca in Scienze della Formazione e Psicologia  
Ciclo XXIX**

***“Bring Your Own Device (BYOD)” for Face to Face and Virtual  
Collaborative Learning in EFL in Secondary School: A mixed methods  
Investigation***

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## **ABSTRACT**

The purpose of this mixed methods study was to create a practical framework for designing and implementing BYOD program supported by collaborative learning strategy in a secondary classroom. Besides evaluating the program effects on students' advancement in two aspects; Firstly, language skills in English as a foreign language (EFL). Secondly; teamwork competencies (TWC). Additionally, the study aims to explore learners' perception towards the whole learning experience and investigate the program privileges and limitation. In addition to exploring how students manage face to face (F2F) and virtual collaboration. Participants included two groups of secondary students aged 14-16 to be the control (20 students) and experimental groups (26 students) for this study. Quantitative and qualitative data were collected using Pre-survey, English test, team competences scale, student's perspective survey, students' interviews, and field notes. Both experimental and control groups exposed a significant improvement in English skills as a foreign language. However, the experimental group outperformed the control group in the English test. In relation to team competences, the experimental group revealed a significant development in teamwork competencies, while the control showed no significant improvement in TWC. Students reported a positive perspective toward the proposed BYOD program and the collaborative learning strategy with no significant difference between face to face and virtual collaboration. The advantages of the program initiative as students reported; enhancing collaboration and peer-learning, getting organized for active learning, timely feedback and social communication with the teacher and groupmates online, the diversity of learning scenarios, boosting productivity and motivation. While the main difficulties according to students were; slow wi-fi connection, managing virtual collaboration were. The field notes, on the other hand, reported challenges faced the teacher during the program, namely in handling the demands of her new role as a facilitator of the learning process in the classroom and beyond (virtual collaboration through the platform) and in the classroom management. The findings of the study propose practical implications for schools and teachers besides some directions for further research.

Florence, 31 October 2017

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To my friends, thank you for your ongoing support during my journey. Your statement that “I can do it” makes me believe in myself and proud to have you as friends.

## **DEDICATION**

To my family; mom, dad, and my siblings,  
Your prayers and warm words were deeply reaching my heart though you are far away. You have always been close to my heart and soul. Thank you for believing in me and pushing me towards my dreams. May God protect you all.

To my soul mate and my tech-savvy; Mohamed,  
Thank you for your constant support, understanding, and tolerance during my study journey. Thank you for being by my side.

My sweetheart Zahraa,  
Yeah! We did it! Your laughter and hugs have charged my energy along the way.

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## LIST OF ABBREVIATIONS

Apps	Applications
BYOD	Bring your own device
BYOT	Bring your own technology
CL	Collaborative learning
EFL	English as a Foreign Language
F2F	Face-to-Face
ICT	Information and Communication Technologies
LMS	Learning Management System
ML	Mobile learning
QR code	Quick Response code
TBL	Task-based learning
TWCT, TWC:	team group competencies test
VC	Virtual Collaboration

## CHAPTER 1

### *INTRODUCTION TO THE STUDY*

#### **Introduction**

In the digital age, mobile technologies have become embedded and ubiquitous in students' lives. In Italy mobile phones are very popular: in 2011, 67.3% of 6 – 17-year-old used cell phones and 56.4% have their own phone (ISTAT, 2012). In 2016, 63.2% of the persons aged 6 and over were connected to the Web, more than 91% of 15-24-year-olds. (ISTAT, 2016).

Moreover, young people aged 15-19 confirm themselves as the best users of personal computer and Internet, their percentages respectively overtake the 88% and the 89%. In 2013, the percentage of people who used the web for interacting with others through social networks and for consulting a wiki increased by five percentage points. (ISTAT, 2015)

These statistics reveal the pervasive use of mobile technologies among young generation for social interaction, but not necessarily for learning. Therefore, there is growing interest in its use in education and training. Educators should develop learning materials for delivery on a variety of technologies, including mobile devices, and teachers will have to be trained on how to design and deliver mobile learning to harness students' learning processes in a safe way.

In the past, technology considered as an expensive option for educational establishments. However, with the widespread use of mobile technologies, many establishments are choosing to adopt Bring Your Own Device (BYOD) initiatives. The BYOD approach allows students to learn with whichever mobile device best meets their needs, with little to no cost to the educational institution (Ally & Tsinakos, 2014), which solve the problem of lacking computers in Italian schools as the report of PISA 2015 indicated “In 2012, there was only one school computer available for every four 15-year-old students in Italy” (OECD, 2015, p.21). However, the use of the technology alone would be insufficient to foster learning without the adoption of appropriate pedagogies (Ertmer & Ottenbreit-Leftwich, 2013) and teachers' readiness to integrate technology into instruction. Deploying mobile devices extends the boundaries of traditional pedagogies towards

student-centered educational practices (Parsons, 2014) which suppose a radical change in teachers' role from the knowledge resource to a facilitator and organizer of the learning process (Turkmen, 2006, p.73). In the light of issues mentioned above, there is a vital need for schools to find more effective ways to integrate technology in daily classroom routine providing teachers with learning environments that support 21st century pedagogies and offer students the chances to develop 21st century skills they need to succeed in tomorrow's world (OECD, 2015)

### **1.1 Background and Rational for the Study**

As mobile devices are becoming ubiquitous, there is an increasing interest in the educational applications of mobile technologies, a research area referred to as mobile learning. Mobile learning refers to “the use of mobile or wireless devices for the purpose of learning while on the move”. (Park, 2011). Typical examples of mobile devices include smart phones, tablets, netbooks, laptops, and personal media players. Mobile devices empower learning to carry out at any time, in any place (Thüs et al., 2012).

Nowadays more and more learners bring their own mobile devices wherever they go for their communication needs. How students perceive and use these various types of personally owned devices to collaborate with their classmates and support their learning has rarely been explored.

As mobile technologies have many unique features such as portability, low cost, small size, user-friendliness, diverse communication networks, a broad range of applications and data synchronization across computers (Huang et al., 2012; Parsons, 2014, p.29) Researchers' interests in investigating the positive pedagogical affordance for education are increasing. However the technology alone is not enough to ensure students readiness to the global competition. The use of technology in education demands for a new pedagogy that can harvest the benefits of sharing, heterogeneous communication and social networking (McLoughlin & Lee, 2007)

This research aims to create a practical framework for designing and implementing mobile-based collaborative activities in the classroom. Besides investigating the effects of incorporating face to face and virtual collaborative strategies with BYOD initiative on students' advancement in two aspects; Firstly, EFL skills. Secondly; teamwork competencies. Additionally, the study aims to explore learners' attitude towards the whole

learning experience, identify the strength and weakness of it and determine how learners' own mobile devices might be centered learners in a course book-driven approach (set by the school) but with mobilized activities (designed by the researcher).

## **1.2 Statement of the problem**

The new generation of students has grown up in the world of mobilization, where they can be connected to the Internet 24/7 and portable computing started to be invaded by wearable and neurological computing. In such rapid and rich environment, schools and policy makers need to create new patterns of learning and social interaction to adapt the way that students learn outside the classroom. On the contrast, most schools worldwide are still banning the integration of personal technology and social network and struggle to provide technological alternatives that deliver an updated form of learning. (Hysten, 2012,p.34)

This gap between what the schools offer and the rich digital environment that surrounds students, makes their learning experience irrelevant to their skills and interests and limiting the opportunities to develop the digital citizenship skills they need to succeed in the 21st century.

However, opening the door for the mobile digital technology in school and firmly grasp the traditional lecture-style teaching will not lead to the desired results. Mobile learning has pedagogical requirements that need to be considered appropriately in order to foster students' learning activities in the digital environment (Jalil, Beer, & Crowther, 2015).

Therefore, it is vital to develop mobile programs that profit from mobile technologies features according to a clear pedagogical framework that can be used to track the whole process of mobile integration step by step.

BYOD program in education is a new field. Scholars provide a few case and pilot studies though BYOD trend in secondary schools rarely has been investigated. Most of the existent part of the literature as the systematic review indicated focused on evaluating the mobile program effects of students' outcomes rather than students' skills. The current study sought to design a mobile program that employs BYOD approach and scaffold by a pedagogical framework to provide learners with a completed learning experience, and then explore how students tackle the mobile activities, the communication and

collaboration to develop their learning and skills. Findings from this research will contribute to the current body of knowledge about this topic.

### **1.3 Research questions and Hypotheses**

This research sought to address the following questions and related hypotheses;

**Q1.** To what extent is there a difference in EFL achievement between students who learn according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods?

H<sub>01</sub>: There is no significant difference between the mean FFL test scores of students learning according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional course and methods?

**Q2.** To what extent is there a difference in group work competencies between students who learn according to BYOD approach supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods?

H<sub>02</sub>: There is no significant difference between the mean TWC test scores of students learning according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional course and methods.

**Q3.** What are students' perspectives of BYOD program with the collaborative group work strategy?

**Q4.** Is there a difference in students' perspective between F2F and virtual collaboration?

H<sub>03</sub>: There is no significant difference between students' mean scores on perspective survey towards F2F collaboration compared to virtual collaboration.

**Q5.** How do students in the experimental group manage the group work?

**Q6.** What do students consider to be the main advantages and limitations of BYOD program supported with collaborative group work strategy?

#### **1.4 Definition of Terms:**

The following terms are clarified to enhance meaning and understanding about the current study;

*Mobile learning (ML)*; is learning that takes place via portable, often Wi-Fi enabled, hand held devices to foster interactivity and provide a flexible learning model.

*Bring Your Own Device (BYOD)*: describes the circumstance in which users make their own devices available for school use.

*Mobilizing the Curriculum*: is the process of converting the curriculum from content and teacher-centered infrastructure to a systematic student-centered structure (Zhang et al., 2010, p.1507) in which students encouraged to utilize the multifunction features of their mobile devices to participate in class discussions, access materials from the Internet, take pictures or videos to be used in completing the tasks and sharing their products.

*English as a Foreign Language Test (EFLT)*: is a test designed by the researcher to assess students' performance in English as a foreign language and covered the main four skills; Listening, reading, speaking and writing.

*Team Work Competencies (TWC)*: refers to a combination of skills that facilitate reaching the team goals. This study elected five skills adopted by Stevens & Campion, (1999); Aguado, Rico, Sánchez-Manzanares, & Salas (2014); conflict resolution, collaborative problem solving, communication, goal setting and performance management and finally planning and task coordination.

*BYOD program*: for this study, the proposed program consists of two units from 10<sup>th</sup> grade English textbook, that have been redesigned according to task-based learning approach and mobilized utilizing the Internet and the proposed mobile applications to create learning environments, in which students can learn by collaborating with groupmates and receiving timely feedback.

*Face to face Collaboration (F2F)*: refers to students work together in small groups in the class to complete their learning task.

*Virtual collaboration (VC):* refers to students work together in small groups after the school day, collaborating in distance to do their weakly assignment utilizing technology to communicate, share ideas and complete the group task

### **1.5 Assumptions and Limitations of the study**

*Assumptions:* Relying on the pilot study, the survey instrument was deemed a valid and reliable means to assess students' perceptions towards their learning experience during the proposed BYOD program, including F2F and virtual collaborative work in groups, learning with an Internet- ready device and utilizing various educational applications. Moreover, the researcher assumed that participated students understood and answered the survey, TWCT, EFLT and interview questions accurately, since they got the Italian version of those instruments (Italian is the students' mother tongue). Additionally, according to the pilot study investigation, the researcher assumed that the introductory sessions were essential and sufficient to inform contributed learners about the program and enhance their abilities to deal with technical issues (for e.g. downloading mobile applications, sharing files on google drive, etc.). See Appendix K.

*Limitations:* Limitations are that possible weakness in some methodological or design features that the researcher cannot overcome them and may affect the result of the research (Price & Murnan, 2004, p.66). For the current study, the researcher claims the following limitations;

1. The school districts are banning students from using their mobile devices during the school day. However, the technology could be integrated into the classroom under the supervision of the teacher. Thus, the seamless learning feature of mobile learning is restricted, and participated students can use their devices during the program only in the classroom and at their homes.
2. The study conditions are additional limits; since the study took place in one public school where two classes with their teachers volunteered to participate in BYOD program; the program has been implemented just for one semester and dedicated to EFL classes. Therefore, the study results are not generalizable to other schools.
3. It is worth mentioning that participants' prior knowledge of utilizing mobile device functionality may motivate them to be more active and engaged in the

program, which may affect their achievement and perception toward the whole experience.

## **1.6 Organization of the study**

The study consists of five chapters. The first chapter provides the background and rationale of the study, statement of the problem, the purpose of the study, research questions, theoretical framework, definition of terms, assumptions and limitations of the study. The second chapter presents a systematic literature review related to BYOD wave in k-12 education, the emergent development of mobile technologies, the importance of the student perspective, IMSA as a model school, and mobile technologies as a learning tool. The third chapter characterizes the research methods, participants selection, data collection for the mixed-methods study and supplies a detailed description of BYOD program design as well as the pilot study procedures. Chapter 4 presents the findings as they relate to the research questions from both qualitative and quantitative data. A summary of the findings, conclusions, and implications is presented in Chapter 5, along with recommendations for future research. The chapter ends with implications for practice and directions for future research

## CHAPTER 2

### **The wave of Bring Your Own Device (BYOD) in k-12 education: A systematic review**

*“If we teach today as we taught yesterday, we rob our children of tomorrow.” (Dewey, 1916)*

#### **Introduction**

To better understand the employment of BYOD approach in the classroom, it is necessary to highlight the BYOD adoption in school. This chapter includes a systematic review of literature related to BYOD programs in k-12 education. The review was conducted to explore; how BYOD approach was integrated in school and how BYOD strategy was used. How this new trend affects student learning and teacher’s role was also reviewed with the intention to collect empirical data that proof the efficiency of BYOD integration in school. Besides, organizing a theoretical pedagogical background about mobile learning in general and BYOD innovation, which provided a starting point and inspired us to do the current research.

#### **2.1 Background for the review**

BYOD indicates a technology model where students bring their wireless devices to support their studies (Alberta Education, 2012). In the literature, many reasons stood behind moving to BYOD strategy. It seems that the lack of funds in schools played a significant role, but it is not the only one (Dixon & Tierney, 2012, p.4; Carey, 2015). Empowering learners through the ubiquity, affordability, portability and the instructional features of mobile devices, are good reasons too (Middleton, 2015, p.26, Figaro-Henry & James, 2016, p. 102, Hodges, C.B. & Prater, 2014, p.75). Adding to that, “mobile devices are part of the 21st-century living and integral to learning 21st-century skills” (Stavert, 2013, p.9). Besides unique opportunities for seamless learning (Song, 2014, Toh, So, Seow, Chen, & Looi, 2012, Milrad, Wong, Sharples, & Hwang, 2013).

As BYOD approach is a new trend in the field of mobile learning, there is a lack of studies that systematically reviewed and analyzed it. Several literature reviews on mobile learning have been conducted in different settings so far. Some studies focused on a particular educational level like the review by Pimmer, Mateescu, & Gröhbriel (2016), which surveyed the empirical studies in higher education, focusing on the effects of

various educational designs (Instructionist, situated, constructionist and hybrid) and their theoretical orientation on students' learning. While Liu, Scordino, et al. (2014) classified studies related to K-12 Education according to the research design into four groups; comparison studies; non-comparison studies; mobilized learning; and academic content areas. The researchers analyzed the learning opportunities through mobile devices and the employment of mobile technology in formal and informal frameworks. Shifting the attention to the use of mobile learning in particular subjects, Crompton, Burke, Gregory, & Gräbe (2016) examined papers that considered science. Another review by Crompton & Burke (2015) observed articles related to mathematics. In both reviews, the researchers highlighted the methodology, science/ mathematical concepts, educational levels, educational contexts, types of mobile devices and the geographical distribution of the studies. Mobile assisted language learning (MALL) has been investigated as well by Viberg & Grönlund (2012) during the period 2007- 2012 regarding research approaches, theories, and models, as well as results.

The former studies have served to present a whole picture of mobile technology implementation in k-12 education. Yet, these studies do not afford any valuable insights into particular trends such as BYOD approach.

## **2.2 Purpose of the review and research questions:**

This review aims to carry out a systematic analysis of BYOD trends in k-12 education published since 2011 to summarize the empirical evidence regarding instructional strategies aligned with BYOD programs and the efficacy on students' learning. The researcher critically analyzed articles published in academic journals that must have specifically investigated mobile learning technology in schools and reported empirical findings. The literature is examined regarding the following issues:

- I. What were the main features of the identified studies (context, aim, and methodology)?
- II. Which types of mobile technology have been exploited?
- III. What models of device ownership have been adopted?
- IV. How has the BYOD approach been aligned with different learning strategies?
- V. What were the instructional effects of BYOD integration on students' learning?

### 2.3 Methodology of selecting articles and analysis procedure:

On the methodological and procedural level, the review was influenced by the work of (Manca & Ranieri, 2013; Peria, 2013) and it was carried out with the intention of identifying scientific articles that, internationally, have investigated and reported empirical results about implementing BYOD approach in secondary school. The selection process was done in **two phases**: scanning phase and skimming phase;

- *Scanning phase:*

To ensure the election of high-quality papers only articles and reports-research that published in peer-reviewed academic journals have been considered, thus excluding conference proceedings, unpublished manuscripts, dissertation and position papers. The systematization of the review started with an extensive research that was conducted in the period from 2011 to 2016, using two groups of keywords; The first group includes “BYOD,” “BYOT” and “Mobile Apps.” While the second group contains; “Classroom,” “School.” The search through the databases was done by linking one keyword from the first group to another keyword from the second group, utilizing the available advanced search options. See Table (1)

Table 1: Criteria for the systematic review

---

<b>Publication type</b>	Only peer-reviewed journal article.
<b>Publication date</b>	From 2011 to 2016.
<b>Language</b>	English.
<b>Keywords</b>	BYOD, BYOT, Mobile apps, Classroom and School
<b>Context of the study</b>	k-12 Education
<b>Resources</b>	ERIC, Scopus, and Web of Science.

---

The research was limited to articles in English on three recommended electronic databases; (1) Education Resources Information Centre – ERIC. (2) Scopus. (3) Web of Science. The search was limited to those databases since they are the most prominent reference sources in academic institutions, except for ERIC specifically devoted to education resources. The remaining databases were consulted on the light of some

selection criteria such as subject area (e.g., educational technology, computer and education, social science) or categories (e.g., educational research).

Next step was the logical processing and recording the number of the taken articles; since dealing with each database required special filtering techniques to get results strongly related to the keywords, the researcher specified the following search and selection criteria for all databases:

- a. Use quotes to group words into a specific phrase (e.g., “BYOD in classroom”)
- b. Specify the field type (e.g., Article title: BYOD, Abstract: “BYOD in school”)
- c. Add search field BY using AND/OR (e.g., BYOD OR BYOT AND classroom)

While the results filtered as followed: (Publication date; since 2011, Publication type; Journals articles, Subject area/ Research domain; Social science & Humanities, Language; English).

The **diagram** below clarifies how the databases matched the keywords with the previous filters in more details;

*BYOD AND classroom:*

- ERIC - 20 articles;
- Scopus - 8 articles;
- Web of Knowledge - 6 articles.

*BYOD AND school:*

- ERIC - 15 articles;
- Scopus - 4articles;
- Web of Knowledge - 4 articles.

*BYOT AND classroom:*

- ERIC - 7 articles;
- Scopus - 5 articles;

- Web of Knowledge – 1 articles.

*BYOT AND school:*

- ERIC - 3 articles;
- Scopus - 4 articles;
- Web of Knowledge – 1 article.

*Mobile apps AND classroom:*

- ERIC –6 articles;
- Scopus - 4articles;
- Web of Knowledge - 5 articles.

*Mobile apps AND school:*

- ERIC – 2 articles;
- Scopus - 2 articles;
- Web of Knowledge -0 articles.

*Mobile apps AND BYOD OR BYOT:*

- ERIC – 12 articles;
- Scopus - 6 articles;
- Web of Knowledge -7 articles.

As of December 2016, the search through the three databases has been activated twice and all updates have been considered. After the exclusion of duplicated articles from all databases, (125) articles have been examined for potential inclusion. However, (60) items have met the criteria listed in Table (1), except the context of the study criteria. See Table (2). The (60) articles (from all educational level) were read and categorized according to the indicators for the systematic skimming process to select studies that match the research topic as follows:

Table 2: Selected articles after scanning phase

<b>Database</b>	<b>No. of extracted articles</b>	<b>No. of selected articles</b>
ERIC	65	46
Scopus	36	16
Web of Science	24	13
<b>Total</b>	<b>125</b>	<b>60</b>

- a. Year of publication
- b. The context
- c. Aims
- d. Research design and method

In order to simplify the reading and schematization of situation for each of the sub-indicators, a unique code was created as it reveals in brackets

- a. *Year of publication*; the studies were spread as follows:

- Year (2011) - 1 items.
- Year (2012) - 4 items.
- Year (2013) – 12 items.
- Year (2014) - 19 items.
- Year (2015) - 12 items.
- Year (2016) - 12 items.

- b. *The context (educational level)*; the studies were classified as follows:

- K-12 Education (K-12) – 33 items; 20 items for Primary school, 12 items for the secondary level and one study that combined Primary and Secondary level.
  - Higher Education (HE) – 20 items.
  - Other (OT) – 7 items.
- c. *Aims*; as regards the aims the studies three topics were identified:
- Testing the effects of BYOD employment in enhancing Teaching-Learning Process (TEB) – 26 items.
  - Exploring Students’ Perceptions to BYOD Program (SPB) – 10 items.
  - Building Digital Learning Environment (DL) – 9 items;
  - Designing and testing a mobile app (DMA) – 10 items;
  - Other (OR) – 5 items.
- d. *Research design and method*; the studies were based on:
- Qualitative Method (QS) – 29 items;
  - Mixed Approach (MA) – 25 items;
  - Statistical or (Quasi-) Experimental Approach S(Q)ES – 6 items.

- *Skimming phase:*

With the aim of focusing on the most relevant studies on the present research topic, a skimming operation has been done in the context of studies that limiting the attention to the k-12 education. That means all the studies relating to the Higher Education (university level), teachers’ development and informal learning for adults were excluded. Depending on the inclusion-exclusion criteria mentioned in Table (1), (26) studies were selected for full-text analysis to extract information related to the review’s questions. Each paper was read and analyzed according to a coding list which involves the following items: (1) author(s) and year; (2) research purpose; (3) type of device; (4) BYOD model (5) and usage; (6) context; (7) research design and methods; (8) findings. The results of this process are shown in Appendix A. The diagram below clarifies the whole process of identifying eligible articles. See Figure (1)

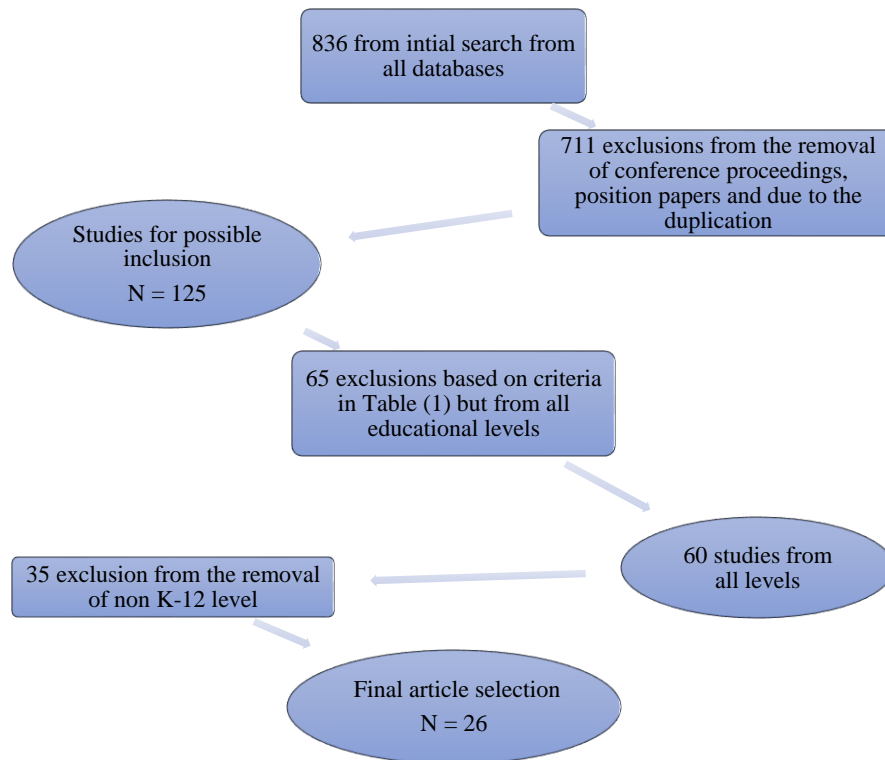


Figure 1: Skimming and scanning process of the review

## 2.4 Results:

The goal of this section is to summarize the results emerged from the literature review. The articles were arranged according to the year of publication, the type of context, the aims, and the research design. Then, the materials were assembled regarding the chosen types of mobile devices, BYOD model, and learning strategy. Finally, the researcher combined the findings of the identified studies taking into consideration the instructional effects of BYOD approach on students learning.

### 2.3.1 Key features of the studies

Since BYOD wave are considered a new trend in Education, most of the studies (65%) were published between 2013 and 2014. (58%) Of the studies related to (k-12), education took place at the primary level (1<sup>st</sup> - 5<sup>th</sup> graders), while (38%) of the studies carried out with secondary level (7<sup>th</sup> – 12<sup>th</sup> grades). Besides (4%) that emerged primary and high school level.

Regarding studies' aims, five subjects were recognized; 13 (50%) out of 26 papers investigated the effects of BYOD employment in enhancing teaching-learning process

(TEB). In the second place, 7 (27%) studies conducted with the aim of designing a learning platform to support collaborative and interactive learning (BDL). While 3 (12%) studies sought developing mobile learning applications to enhance students learning in different subjects and improve unique skills (DMA). Two studies (8%) explored students' perceptions of BYOD Program (SPB), besides one study (3%) that dedicated to collect statistical data about BYOD model implementation in schools (OT).

According to the research design and methods, the papers employed the qualitative methodologies (46%), that concern analyzing texts artifacts and interviews, besides mixed strategy (42%), which incorporates qualitative and quantitative data. On the other hand, just (12%) utilized experimental or quasi-experimental approach. All the mentioned features have been reviewed in Table (3)

Table 3: Features of studies

		Context			Aims					Research design and methods		
		K-12										
Year	No. of studies	PS	SS	PS+S	TEB	SPB	BDL	DM A	O T	QS	MA	S(Q)ES
2011	1	0	1	0	1	0	0	0	0	0	1	0
2012	1	1	0	0	0	0	1	0	0	0	0	1
2013	10	6	4	0	4	1	4	1	0	3	6	1
2014	7	5	1	1	4	1	2	0	0	5	2	0
2015	3	1	2	0	1	0	0	1	1	2	0	1
2016	4	2	2	0	3	0	0	1	0	2	2	0
Total	26	15	10	1	13	2	7	3	1	12	11	3
%		58	38	4	50	8	27	12	3	46	42	12

Note. PS = Primary school, SS= Secondary school, TEB = Testing the effects of BYOD employment in enhancing Teaching-Learning Process, SPB = Exploring students'

perceptions of BYOD program, BDL = Building digital learning environment, DMA = Designing and testing a mobile app, OT= Other, QS = qualitative approach, MA = mixed approach, S(Q)ES = experimental or quasi-experimental approach

### 2.3.2 BYOD: which, what, how?

**Which types of mobile technology have been exploited?** In the given figure below Figure (2), the studies have utilized a wide range of mobile technologies. The major part of studies (58%) have been precise and limited the choice to a particular type of devices (15% mobile phone, 15% iPad, 8% Tablet, 8% PDA, 4% iPod, , 4% Asus Eee Pad, 4% Laptop) or demanded a explicit system. As in (Avraamidou, 2013) in which handheld devices with Windows operation system have been exploited. On the other side (42%) were flexible with the type of mobile device and enabled students to bring whatever they preferred or can offer since it is an Internet-Ready device.

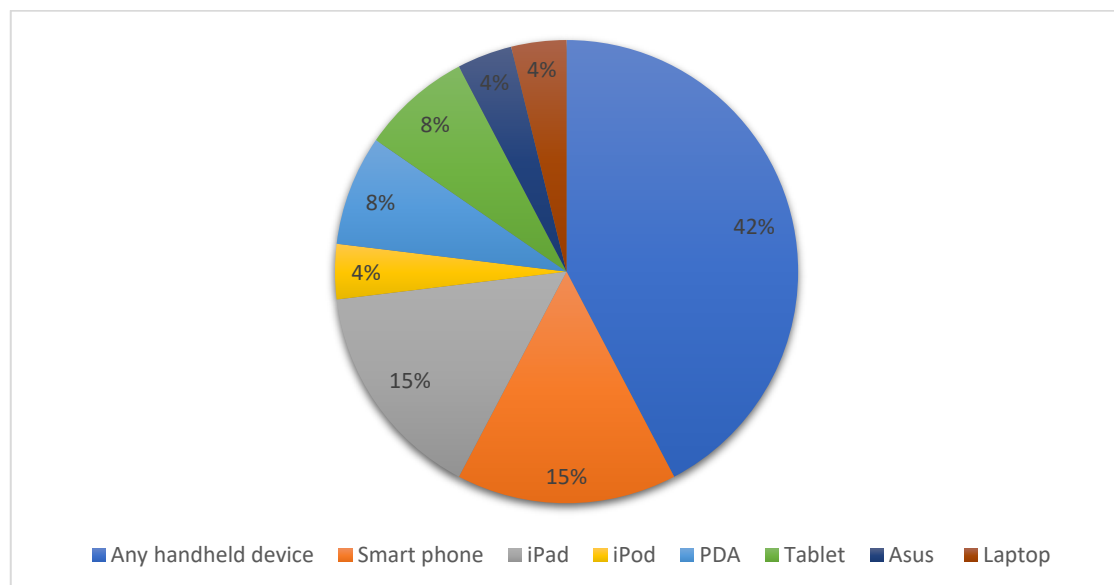


Figure 2: Studies by the type of mobile device

**What models of the device ownership have been used?** As shown in Figure (3), the reviewed studies took advantage of four models of the device ownership. School's devices ownership model with (12 studies, 46%), in which the school provided the students with the required mobile devices and took the responsibility of them, except the case that students had the permission to take the device home as in (Looi & Wong, 2014). Students' ownership model of the device (BYOD) was applied slightly less than the first

model with (11 studies, 42%) where students brought their own mobile devices, and they were entirely responsible for them. Additionally, two studies (8%) took advantage of the Mixed model; where students and school shared the ownership of the required mobile devices. (Song, 2014; Conway & Amberson, 2011). Besides, one more study(4%) that benefited from an external private funding support (Ekanayake & Wishart, 2014; Nedungadi & Raman, 2012).

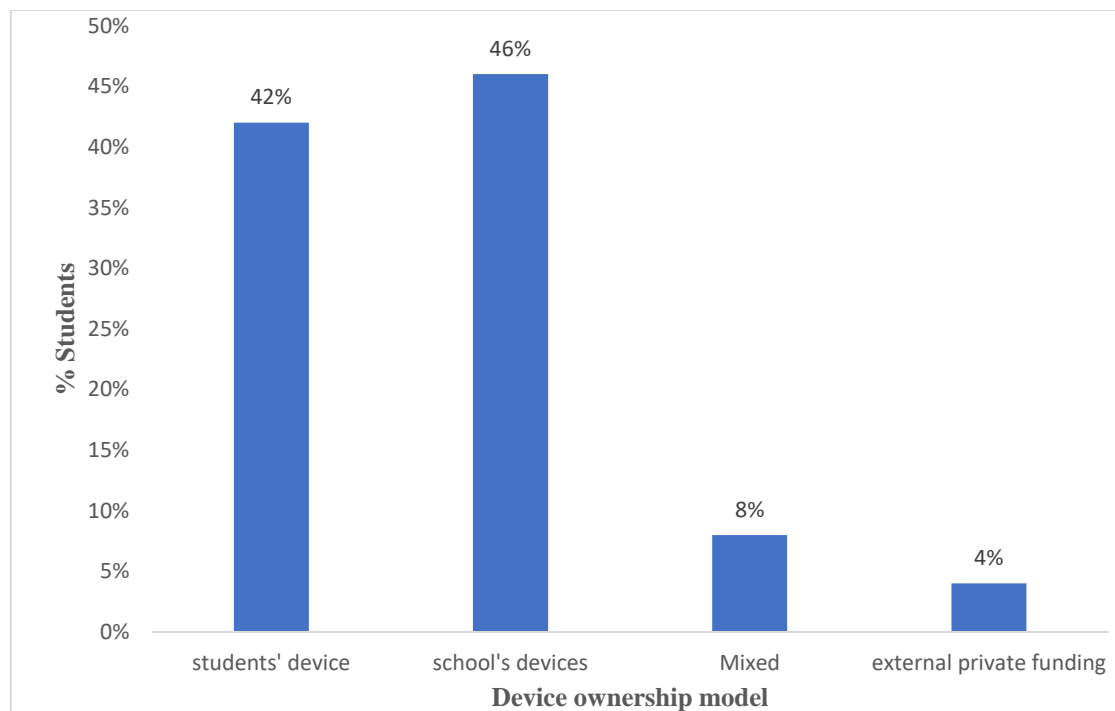


Figure 3: Studies by the device ownership model

***How has BYOD approach been integrated?*** The analysis of the studies focused on learning strategy (individual vs. collaborative) exploited to implement learning activities with mobile devices. Learning activities in most of the studies (16 studies; 61%) were designed to facilitate individual learning (1:1 learning model), where a student could complete his learning tasks independently using his mobile device and utilizing some mobile apps. While in (8 studies; 31%), the activities were designed to support collaborative learning, where students work in peers or in small groups to accomplish their learning task making the use of their mobile devices to access the Internet, log into the learning platform and exploiting some mobile apps. Still, there were (2 studies; 8%) combined the use of BYOD approach with both learning strategies. A diagrammatic presentation of these results can be found in Figure (4)

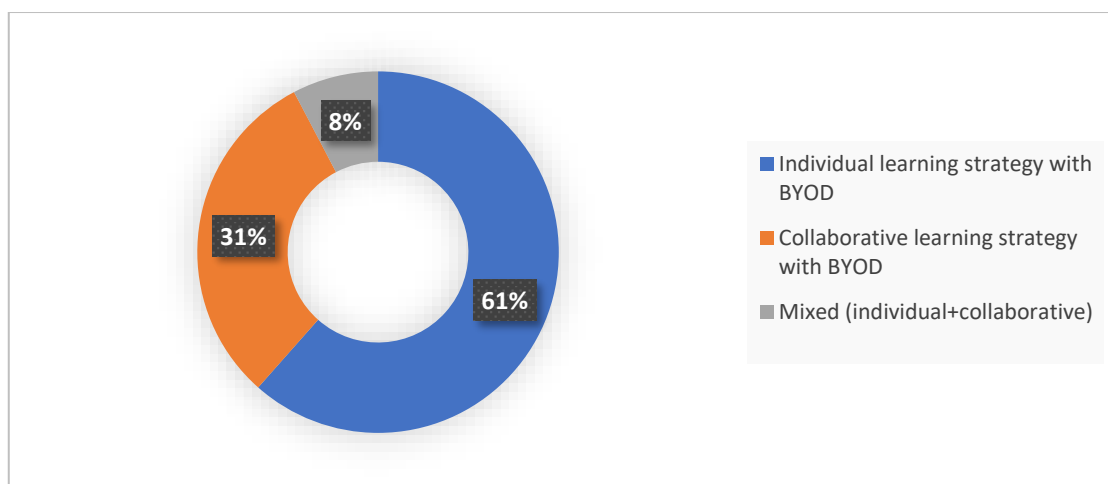


Figure 4: Studies by learning strategy to integrate BYOD

### ***2.4.3 The instructional effect of BYOD approach***

The analysis indicated that (13 studies; 50%) aimed to test the consequences of BYOD employment in enhancing Teaching-Learning Process, see Table (2). Two of those studies focused on students' outcomes in different learning subjects (Hsu, Hwang, Chang, & Chang, 2013; Looi & Wong, 2014). While the other 11 studies sought to identify how BYOD approach could affect students learning and the results showed that the adoption of BYOD strategy helped to remove the walls between the classroom and the outside world, assessing students learning and correcting students' misconceptions (Ekanayake & Wishart, 2013). Besides, the opportunity to provide differentiated instructional support and extend learning time from classroom to home (Liu, Navarrete, & Wivagg, 2014). Further, BYOD program contributed to reconceptualise the language tasks by allowing young learners to create their learning environment as well as supporting self-regulated learning (Ciampa, 2014).

Moreover, (7 studies; 27%) proved that providing students with learning activities supported by a designed mobile learning system enhanced their collaboration and motivation through the real-time interaction and feedback (Lee & Son, 2013). However, just two studies dedicated to investigate students' perspective toward BYOD experiment like in (Avraamidou, 2013) where students engaged in the activities with great interest and enjoyed the collaboration during the project. Papers that focused on testing few designed mobile applications (3 studies, 12%) have confirmed employing mobile

applications is bringing the real world into the school and efficiently reinforce student learning (Hung, 2016; Kanala, Nousiainen, & Kankaanranta, 2013). Overall, the students had positive perceptions and intentions toward mobile learning activities (Hwang, Huang, Shadiey, Wu, & Chen, 2014)

## **2.5 Discussion**

The experiences carried out largely between the 1<sup>st</sup> and 5<sup>th</sup> grades, and that refers to the growing interest and acceptance of early integration of mobile learning since the new generation considered as a digital native one and students require to develop the 21<sup>st</sup>-century skills. Half of the studies sought to explore how BYOD programs mechanisms facilitate teaching-learning process. However, one of the main challenges that confront the employment of BYOD is the absence of a balanced curriculum framework which boosts seamless learning and connects activities inside classrooms with the informal learning opportunities in the outside (Khaddage, Müller, & Flintoff, 2016) thus; scholars should focus more on this topic in future. Qualitative and Mixed methodology were the primary design approaches for studies with no real dominant methodology while thus almost both styles consistently considered. This finding matches the result found by Crompton & Burke ( 2015), Crompton et al. (2016) and contradicts the one found by Saleh & Bhat (2015) which revealed a superiority in employing experimental methods for evaluation and designing of mobile learning systems.

Despite the variety of mobile devices, mobile phone and iPad were the dominant categories, replacing the use of PDAs and iPod due to the new invention in mobile technology which is rapidly spreading, so even mobile phones and iPad will probably be swapped with the wearable devices in a short time. One of the interesting findings from the data was the fact that most studies preferred standardized mobile devices rather than hosting the flexible model. That is probably to ease the teacher's mission. Especially, when it comes to handling technical problems, design, plan and teach the activities with mobile devices (Alberta Education, 2012, p.12). Another possible reason for adopting the fixed model is to avoid the inequality access issue since not all devices have equal features considering the usability (Estable, 2013, p.22)

What is even more interesting is that the papers relied on the school more than the students in providing the devices, and that went in parallel with utilizing the fixed model of the device. It is also noteworthy that School's devices ownership model accompanied mostly

with individual learning strategy on campus use, owing to the rare possibility of extended learning to home while students' ownership model combined very often with a flexible model, so students could bring any mobile device that they or their family own. The scarcity of external private funding support was another thing to be highlighted. Therefore, the educational authority should make more effort to attract local and industrial partners to support mobile learning projects.

The literature reflects positive outcomes, and favorable viewpoint from the students toward a multiple approach BYOD program (individual vs. collaborative and formal vs. informal) and that comes in line with previous reviews (Crompton et al., 2016; Crompton & Burke, 2015; Saleh & Bhat, 2015). Students' motivation has been enhanced through curiosity, competition and cooperation (Ciampa, 2014). Though, several challenges have been identified by the studies, such as the need for professional training for teachers to tackle mobile devices in their classrooms and empowering the school environment with hubs and ports for wireless access and other supporting technologies.

## **2.6 Limitations**

A systematic review is a method of making sense of large bodies of information in a specific field at one time. The study was restricted in the inclusion and exclusion criteria identified in Table (1), so the focus in selecting the papers was articles published in English and carried out in formal learning situations.

## **Summary**

This study conducted a systematic review of papers published from the year 2011 to 2016, with the aim of emphasizing BYOD experiences in k-12 education. This review manifests seven new findings: (1) there is an interest in early integration of mobile devices; (2) The identified studies aimed mostly at estimating the value of BYOD programs while designing a digital learning system came next; (3) the conventional methodologies utilized in the papers were qualitative and mixed approach;

(4) According to the type of mobile device, the major part of the studies adopted the fixed model with mobile phones or iPad; (5) schools' devices were more employed than students' devices; (6) the studies focused mainly on personalized learning activities with individual learning strategies; (7) overall, the review did find constructive uses of emerging BYOD trend in (K-12) education with positive attitude from the participants

toward the experiment.

Further research needed to shed light on the use of personal mobile devices, owned by students instead of those provided by the school. Another area which deserves more attention is the limited period of BYOD experiments, education which range from several weeks to a few months. Hence, more long-span studies are recommended to guarantee effective engagement from the students with the mobile-based environment and open the possibility to track their improvements. It is also noteworthy to highlight that most of the experiments are focusing on 1:1 technology and personalized learning. Thus, collaborative mobile learning projects could be explored under different conditions such as 1:1 technology with collaborative learning strategies, sharing devices in groups and combining individual and collaborative strategies in the same experiment utilizing both approaches.

## CHAPTER 3

### METHODOLOGY

#### **Introduction**

The chapter presents the methodology to achieve the aims and verifies the hypotheses of the study. The intent of this study was to design, implement and evaluate a BYOD program based on collaborative group work strategy to enhance students' performance in English as a foreign language and their group work competences. Moreover, the researcher explored students' attitude toward the whole program; the use of ownership mobile devices in learning, the experience of collaborative working groups in the classroom as well as the virtual collaboration environment since the students encountered both types of collaboration at the same time.

This chapter starts with a restatement of research questions and hypotheses, followed by a description of data collection procedures and a justification of the data analysis procedure choices for both the quantitative and qualitative research questions. Next, the following will be addressed in regard to the study; research design, research questions, research hypotheses, variables, sampling and participants, instruments, validation and reliability, the design process of BYOD program, pilot study, data analysis and finally the ethical consideration.

#### **3.1 Research Design**

A mixed method, the quasi-experimental study design was employed in this study to investigate whether, how, and to what extent the proposed BYOD program compared to the traditional learning program, improves students' English efficiency and their group work capabilities. Leech & Onwuegbuzie (2009) define mixed methods research as research that involves collecting, analyzing and interpreting both qualitative and quantitative data in the same research. Specifically the study employed an embedded method with a quasi-experimental model, wherein the quantitative dataset has a precedence and occupies the main concern while the qualitative dataset is supplementary (Creswell & Clark, 2011, p.69). Varying the data collection approach as Axinn & Pearce (2006) claimed can; (1) support the research by supplying information from one method

that was not acknowledged in an another method; (2) decrease non-sampling error by affording extra information from different sources and (3) prevent duplicated potential bias coming from one specific approach (p.19). According to the mentioned rational points and the need of quantitative and qualitative techniques combination to address the study questions, mixed method strategies are considered valuable for the current study. The quantitative data from English test, group work competencies scale, the survey and their subsequence analysis were exploited to answer the first four questions and provide a general understanding of the study problem. On the other hand, the qualitative data collected from interviews were crucial to address the last question regarding the experiment, follow up in depth with the experimental group, as well as adequate understanding of statistical findings of the study (Axinn & Pearce, 2006; Teddlie & Yu, 2007; Tashakkori & Teddlie, 2010; J W Creswell & Clark, 2011; John W Creswell, 2014).

As Figure (5) shows, the nature of the experiment was to compare two groups on the impact of learning according to BYOD program supported by collaborative teamwork strategy versus learning according to the normal text book and traditional methods on students' efficiency in EFL

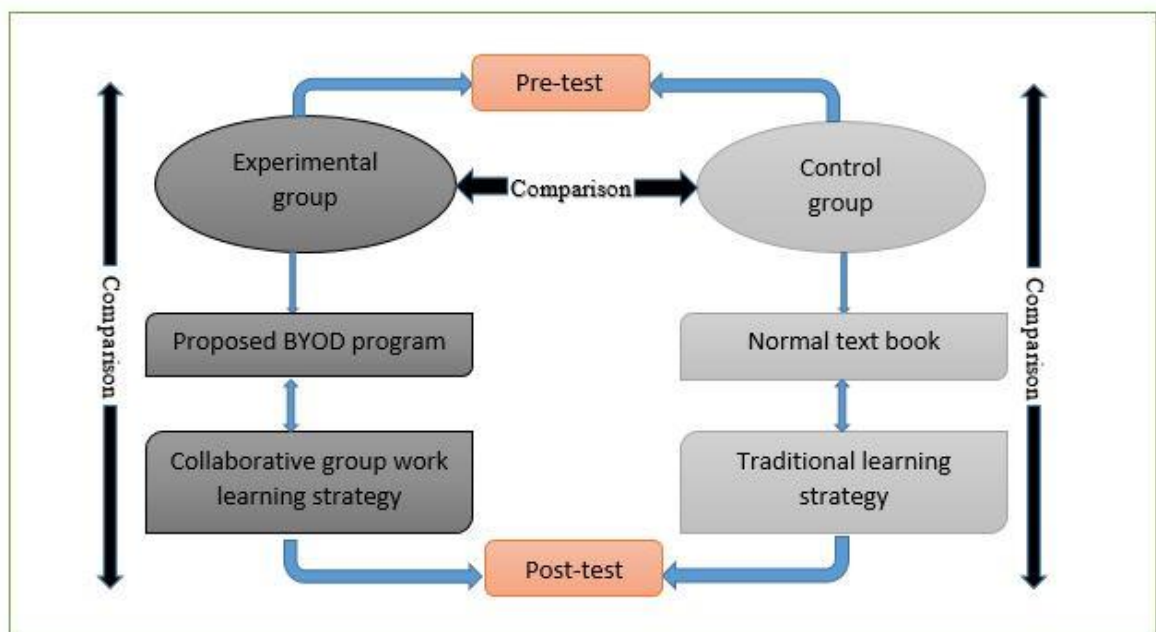


Figure 5: Study design diagram

and the improvement of their group work competencies. Students in the experimental group have learnt according to the proposed BYOD program based on collaborative

teamwork strategy in two different settings; F2F collaboration in the classroom and virtual collaboration, while students in the control group learnt materials from their normal text book with the traditional learning methods in the classroom.

### **3.2 Research Questions**

Six research questions guided this study:

**Q1.** To what extent is there a difference in EFL achievement between students who learn according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods?

**Q2.** To what extent is there a difference in group work competencies between students who learn according to BYOD approach supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods?

**Q3.** What are students' perspectives of BYOD program with the collaborative group work strategy?

**Q4.** Is there a difference in students' perspective between F2F and virtual collaboration strategies?

**Q5.** How do students in the experimental group manage the group work?

**Q6.** What do students consider to be the main advantages and limitations of BYOD program supported with collaborative group work strategy?

### **3.3 Research Hypotheses**

To verify whether the BYOD program provides benefits in terms of learning performance in English and group work competences, the study encompassed the following null and alternative hypotheses:

H<sub>0</sub> 1: There is no significant difference between the mean FFL test scores of students learning according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods.

H<sub>0</sub> 2: There is no significant difference between the mean TWC test scores of students learning according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods.

H<sub>0</sub> 3: There is no significant difference between students' mean scores on perspective survey towards F2F collaboration compared to and virtual collaboration.

### **3.4 Variables**

Independent variables according to Creswell (2014) are “those that (probably) cause, influence, or affect outcomes. They are also called treatment, manipulated, antecedent, or predictor variables”(p.52), While the dependent variables are “variables that depend on the independent variables; they are the outcomes or results of the influence of the independent variables. Other names for dependent variables are criterion, outcomes, effect and response variables” (p.52). For the current study, the independent variable was the proposed BYOD program, while three dependent variables were studied; students' achievement in English as a foreign language (EFL test scores), group work capabilities (TWC scale scores) and students' perspectives towards BYOD program with the collaborative learning strategy (Perspective survey scores).

### **3.5 Sampling and participants**

The participants came from a public secondary school located in Florence, Italy. The groups were initially obtained through convenience sampling. This type of sampling had been chosen for two main reasons. First, the teacher who agreed to participate in the study and volunteer her classes was from this school. Second, the willingness of the school head Ministry to host the program and facilitate some school districts related to provide the experimental group students with Wi-Fi connection and give them the permission to use their mobile devices in the classroom, since the use of any electronic devices during the class time and passing periods is prohibited. The school is an institute of upper secondary level that prepares students to achieve, after passing the national exam, a qualification enables access to various university courses. The school has three fields of study; Language High School, School of Human Science and School of Human Science with a social and economic option. The participants in this study were selected from the

Language High School which guide students to develop the necessary knowledge and skills to acquire communicative competence in three foreign languages (English, French and German) besides understanding the historical and cultural identity of different civilizations. Two classes of the intermediate level of English students with ages that ranged from 14 to 15 years were the potential participants with 46 students (the experimental group: 26, the control group 20).

### **3.6 Instruments**

The essential justification behind mixing two methods is to overcome the limitation of qualitative or quantitative methods by relying on the strengths lies in the other. This study immersed the interview as a qualitative data source with the test, TWC scale and the perspective survey as sources for the qualitative portion with the intention to answer the research questions efficiently.

#### **3.6.1 *Pre-survey***

The pre-survey aimed at describing students' awareness and usage of mobile technology and mobile applications before starting the experiment. Twenty-five students completed the pre-survey which was created online and comprised of seven multiple choice format questions. The survey collected data related to; types of students' mobile devices, students' usage of their mobile devices for educational purposes, students' ability to utilize Google drive in saving files, sharing documents and accomplishing a learning task besides students' awareness of the mobile apps employed in the proposed BYOD program. See Appendix P.

#### **3.6.2 *EFL Test***

The test was designed to assess students' skills in English as a foreign language (EFL) based on the content that they learnt during the program. The test was paper-based, administered face-to-face by the teacher, and scored twice by two English teachers, who have been teaching English in secondary school for more than ten years, to reduce the bias and guarantee the reliability of the test's results. The test lasted 60 minutes and consisted of five sections; (a) Reading, (b) Grammar, (c) Listening, (d) Writing and (e) Speaking. Each part comprised 5 questions with 20 points in total. The overall maximum grad was 100 (See Appendix B.). The test was applied twice; before and after the experiment.

### 3.6.3 TWC scale

In order to estimate students' teamwork competencies (TWC), the researcher adopted a scale designed by (Aguado et al., 2014) with little modifications related to the validity and translation issues. The scale used a 4-point response of frequency (1 = never, 2 = almost never, 3 = almost always, 4 = always). Five transportable group work competencies were involved as shown below in Table (4);

Table 4: TWC scale dimensions with items' numbers

The dimension	The items numbers
Conflict resolution	1-3-7-13-14-17
Collaborative problem solving	12- 22-23-24-26-28
Communication	2-5-8-9-15-25
Goal setting and performance management	6-16-18-19-27-29
Planning and task coordination	4-10-11-20-21-30

(I) Conflict resolution; During the team work in a joint task, conflicts can happen for example when lots and different types of information are gathered about the studied topic, then the team must decide which data should be considered and presented. So, conflict resolution in this sense reflects the ability to implement a suitable strategy to solve the conflict such as using a majority vote decision.

(II) Collaborative problem solving; It represents a shared understanding of different aspects of the problem and taking advantage of various perspectives and ideas that arouse creative solutions.

(III) Communication; It represents the understanding of communication networks, utilizing open and supportively communication and using active listening techniques.

(IV) Goal setting and performance management; The ability to establish specific, challenging and accepted team goals, Monitor, evaluate, and provide feedback on the team performance.

(V) Planning and task coordination; It refers to launching task and role expectations of individual team members and ensure proper balancing of the workload in the team.

The scale included (30) items, hence the lowest score may students got on this test was (30) while the highest one was (120). The researcher rated the scores as the following;

$30 < \text{score} < 60$ : Not applicable,  $60 \leq \text{score} < 75$ : somewhat effective,  $75 \leq \text{score} < 95$ : effective,  $95 \leq \text{score} < 120$ : highly effective.

The researcher got the English version of the TWC test (See Appendix C.) while the favorable version for the current study is the Italian one since it represents the students' mother tongue language. Consequently, an equivalence TWC test was developed with the support of a group of bilingual professionals in English and Italian who were involved in this process. Lastly, the final Italian version was reviewed by the researcher and her supervisor to ensure that the meaning of the items was consistent in the different translations (See Appendix D.). The scale was implemented before and after the experiment to examine the proposed BYOD program effects on students' group work competencies.

#### **3.6.4** *Perspective survey*

With the purpose of collecting data to answer the research question related to investigate students' attitude towards their learning experience throughout the proposed BYOD program, the investigator designed a 30 item five-point Likert scale. The survey covered four dimensions;

(a) *F2F Collaboration in groups*; This part included 7 items (statements 1-7) explored student's attitude toward face to face collaboration in small groups.

(b) *Virtual collaboration in groups*; This part involved 7 items as well (statements 8-14). It inspected student's point of view toward distant collaboration in small groups using online tools to do their assignments.

(c) *Learning with a wireless connected mobile device*; contained 5 items (statements 15-19) that checked student's opinion about utilizing their mobile devices that connected to the Internet for learning purposes.

(d) *Learning with educational mobile apps*; this section had 11 items (statements 20-30) which surveyed students' standpoint of using educational mobile apps to enhance their learning (See Appendix E. and F.). The scale of measurement in this research

was ranging from 1 “strongly agree” to 5 “strongly disagree”. The lowest score may students got was (30) while the highest was (150).

### **3.6.5 Interviews**

Different types of interviews can be employed in research; such as structured, semi-structured, and unstructured. In structured interviews, the researcher follows scripted questions in a predetermined sequence. In contrast, unstructured interviews involve free flowing conversation where the interviewer and interviewee ask questions and make meaning together. In the middle are semi-structured interviews, in which the interview protocol is used as a guide, but adaptable in the order questions are asked and followed up with probes based on the responses of the individual participant. (Seidman, 2013; Rabiee, 2004b; Frey & Fontana, 1991).

In this research semi-structured, open-ended group interviews have been administrated with interest in a subjective understanding of students’ lived experience (Seidman, 2013). Frey & Fontana (1991) stated that “group interview can provide a greater depth of understanding of the field context and about relations of the members of a particular setting...it takes advantage of group dynamics, provides insight into social relationships in the field”, p.15. Thus, the interviews have the advantage of enabling students to reflect on their experiences related to collaborative learning in groups supported with mobile apps, beside finding out the advantages and limitations of that experiment from students’ point of view. Additionally, the interviews serve in assembling students’ suggestions for future improvement. The semi-structured, open-ended format has been chosen for interviewing the students to decrease the chance of bias as well.

The interviews lasted 60 minutes and were conducted in groups at the end of the program. The interview protocol comprised 5 items; date, time, location, the interviewer, and the interview questions (See Appendix G.). All the interviews were recorded (audio only), transcribed and then coded by topic and themes.

### **3.6.6 Fieldnotes**

The researcher took a regular descriptive and reflective fieldnotes of students and teacher behaviors during the program learning sessions. Descriptive fieldnotes describes the physical environment and the diverse settings of activities, students and teacher reactions. While the reflective fieldnotes concerns the researcher's points of view towards the observed behaviors (Brantlinger, Jimenez, Klingner, Pugach, & Richardson, 2005, p.205).

The fieldnotes aimed at highlighting the data that serve to answer the study questions and provide support and augmentation results analysis. The data from fieldnotes was coded like the interviews' transcripts to report findings to the research questions.

### **3.7 Validation and Reliability**

Regarding the validity, the study instruments were designed to ensure the reliability and the validity of the collected data by considering the wording and the language of the statements and questions, avoiding leading or vague words and ensuring the confidentiality and anonymity of students' identities in the collected data. Additionally, all the instruments (test for EFL, survey, TWC scale and the interview questions) were examined by a group of experts to display their agreement or disagreement to each item and leave a comment to ensure that it was representative or not to the tool's objectives. The experts were also asked to make notes on the measurement items included.

In terms of reliability, the TWC scale was adapted from an existing test (Aguado et al., 2014), which had proven to be a valid and reliable instrument since Aguado and his colleagues explained three studies provided evidence of the TWC test validity. The five dimensions of the test presented adequate Cronbach's alphas of more than (.80), except the Conflict Resolution scale, which has an alpha of (.71). The alpha for the total scale is also adequate (.89). The original scale entailed (36) items and it was written in English. Based on the experts' recommendations, who reviewed the scale, 6 items were rephrased, and 6 items were omitted. Thus, the final version comprised (30) items. On the other hand, the survey was validated through test trials to two groups of students (60 students) from a school with similar characteristics to the participants in the project. The Cronbach's alpha was adopted as a reliability test to estimate the internal consistency of the survey. The Cronbach's alpha was performed on all survey subscales as well as on the total (30)

items. The values for the four dimensions were higher than (.70), which indicated the reliability of the survey and the alpha for the total survey was also adequate (.87). Besides, test-retest reliability after one month was also high and statistically significant ( $r = 0.86$ ,  $N = 60$ ,  $p < 0.0005$ ).

The test of English as a foreign language has been piloted and reviewed as well by applying the test to the (60) students and get a feedback about the time needed to complete the test and the quality of the test structure. All test items had been aligned with a set of objectives outlined in the English textbook and curriculum maps. It is believed that this alignment process helped to support the content and construct validities of the test. Moreover, the test was rated twice by two English teachers to assure the reliability of the results and diminish the bias. A strong positive correlation was found between the two set of scores ( $r = 0.90$ ).

Finally, the scholar has involved an outside reader or a Peer debriefing (Janesick, 2007) to enhance the trustworthiness and credibility of the interview audio, scripts and coding plan (John W Creswell, 2007; Spillett, 2003). The reader's mission was to do a critical reading of the data and the final description and identify whether or not the researcher has laid too much stress on a point or under-emphasized a point.

### **3.8 Design Process of BYOD program**

The design and organization are the keystones to successful learning, and integral to the overall direction of learning content that is focused on clear learning objectives and goals. This study introduced the BYOD mobile learning innovation as an instructional strategy in two chapters from the 10th grade curriculum, the content of the program delivered in a blended mode: face-to-face and virtual mobile language learning activities.

Choosing the framework is essential to move from the academic theorizing about mobile learning to operational and successful use. The framework adapted for this study is FRAM model which stands for Framework for the Rational Analysis of Mobile Education. This model was espoused by Koole (2009). Koole's model considered not only the technology element of mobile learning but also the social and personal aspects of learning. Kool (2009) stated that "the FRAME model describes a mode of learning in which learners may move within different physical and virtual locations and thereby participate and interact with other people, information, or systems – anywhere, anytime"

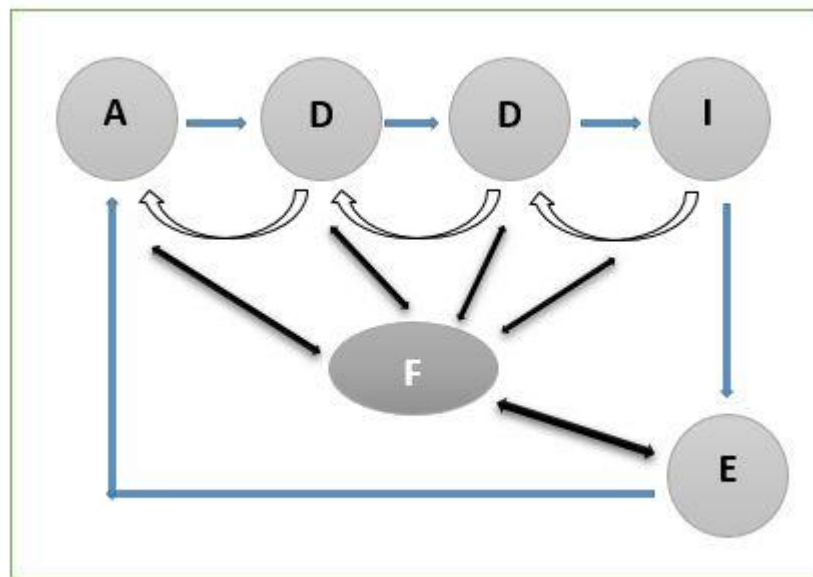
(p. 26) and that is why this model has been adopted for the current research. It aligns with the study goals and the researcher's perceptions about the proposed mobile learning program in the sense of giving learners more psychological and communication space with their instructor and other students.

The content of BYOD program was designed based on (ADDIE) model; a systematic approach to a generic instructional design process. ADDIE acronym captures the Analysis-Design-Development-Implementation-Evaluation process. This approach was commonly used in the development of instructional courses (Hosler, 2013; Cooper, 2014; (Iii, 2014); Aditya, 2016; Acock, 2016). The researcher started from a socio-pedagogical perspectives standpoint and continued with technological considerations depending on ADDIE Model to develop better instruction and learning through the integration of pedagogy and technology. The design process run in an interactive cycle with a specialty for each phase. See Figure (6).

*A. Analysis;*

In this stage, the information on the participants and the selected course were collected. The researcher conducted a pilot survey to gain better understanding of the types of mobile devices that students may learn with and their prediction about mobile learning program, their learning style, and the learning strategy that they prefer besides exploring the context especially the potential resources, the instructional goals and objectives and the traditional learning environment through a discussion with teachers. The permission to conduct the study was obtained from the school headmaster, teacher and students in this stage as well. The teacher introduced the concept of BYOD to their students who read and signed a BYOD Policy Agreement. The policy requires that students are allowed to access the Internet only via the wireless school network, follow the districts of acceptable use policy and assume all responsibility for their technology tools when bringing them to school. (See Appendices Q, R)

Figure 6: ADDIE Model



B. *Design;*

In designing mobile learning activities, the researcher benefited from the previous analysis and put a set of pedagogical, technical and learning objectives for the potential content (two units from students' English text book), general and detailed plans for the all sessions were developed carefully taking into consideration students' need and prediction from the analysis phase. The plans framed all design features;(Thomas & Reinders, 2010, p.140). (See Appendix H., I)

- I. Objective: The aim of the task, e.g. to practice useful structures; comprehension reading, the use of adverbs of manner, etc.
- II. Input: The task instruction which explains students' performance in each step. The input could be presented as audio, a short video or online presentation.
- III. Condition: The way in which the information is presented, e.g. the utilized application; web applications vs. mobile applications, learning performance; collaborative learning in small groups or peer collaborative learning vs. individual learning and collaboration settings; face to face collaboration vs. virtual collaboration.
- IV. Procedure: The main possible opportunities for implementing the tasks, e.g. "online vs. offline; during the class time vs. one-week deadline"

- V. Predicted outcome: which is the result of completing the task, e.g. a mind map; a podcast; a game; a created video; a recorded audio or a presentation.
- VI. Product: The product depends on the nature of the task itself. Therefore, the solution could be open for many suggestions or could be just one right answer.

The researcher presented Task based learning (TBL), as an appropriate approach for planning the activities procedure in each session, because it requires a high level of creativity and initiative, stimulating students to consult recourses beyond the textbook, besides it is not a teacher- center, so it involves the learners and offers them the opportunity to be active and take the responsibility of their learning (Pellerin, 2014, p.3).

According to this approach, each lesson plan involved maximum two tasks designed by the researcher to be completed by the students during the class time (face to face collaboration in small groups) and at the end of each lesson, a new task presented to students as an assignment for the next session, which requires students' virtual collaboration in groups through web2.0 tools to do the assignment and publish it on the proposed platform before the deadline. There is no focus on a single activity or a single mobile application, but a combination of activities and applications. Each task runs through three phases;

- Pre-task: This phase starts by rearranging the layout of the classroom and switching students' chairs and desks from straight rows to face to face position in order to ease collaborative learning. Establishing the work groups are organized in this phase too. Furthermore, the teacher provides clear instructions on how to complete the task by utilizing the mobile devices with the proposed applications through a warm up presentation.
- During the task: Students are engaged in accomplishing the task in small groups, cooperating with each other to choose the suitable materials, discussing and exchanging knowledge, organizing their work and then formulating their final product (audio, video, presentation, etc.) using the proposed apps and mobile devices functions. Integrating mobile technology aimed at boosting students' involvement and interactivity in their learning (Tai, 2012, p.225). The teacher in this phase works as an observer and a guide while the researcher is the tech- savvy who provided

his consultation to solve technical problems and push the students to work virtually supporting them with important tips.

- Post-task: The keywords for this phase are reviewing, reflecting and feedback. Since publishing the group's work and share it with other groups is a part of the task design, all groups have the chance to reflect on other groups' work and provide them with informative feedback. That offers students the possibility to learn from the group member during the task and from other groups in this phase which improve students' engagement in learning. The teacher goes through each groups' work, and facilitate the discussion between the groups about the results of the task, while for the assignment activities, the whole phase is done online through comments and synchronous conversations utilizing the proposed LMS.

Important Principles were taken into consideration in designing (mobilizing) the learning activities:

- Proposing the suitable apps to complete each activity taking into consideration three main factors; proposing just free apps, open apps which are available for different mobile devices system or offering different alternative apps and relying on native apps which can be downloaded to the device more than web apps which run through the device internet browser.
- A space for students' choice and voice: through providing them with several alternatives resources, educational apps and materials to consult their group members and decide which to choose.
- Also facilitating students' participation and productivity: students produce their learning outcomes (stories, biographies, dictionaries, films, podcasting, maps, posters, presentations and games).
- Technical issues, such as; file type, organization, length of learning content, culture and language, connectivity, motivation, and assessment (Estable, 2013, p.21). Some file types that are more ubiquitous across devices than others and those would better suit a BYOD context, which reflow and resize text thus making it suitable for all screen sizes. The researcher has tasted carefully all file types on the most commonly used mobile devices before implementing them to guarantee the ease of use. Further, the better organization of the task then the higher the

students' autonomy. Thus, each task has been clarified with step by step guideline to guarantee students' understanding of the procedure. Not to mention the importance of making the written instruction or messages on the platform or whatever as simple and brief as possible since the students will access this information from their mobile devices which has a small screen size. And to reduce the negative effect of bad Internet connection, a backup plan for each lesson was always ready with small size, downloadable materials that students can learn from it offline. The motivation is another significant component in the learning process. Consequently, the researcher intended to design appropriate tasks that related to students' social environment and fit their need. That type of tasks stimulates the learners and gives them the sense of achievement.

In relation to assessing students' work, a holistic evaluation plan was proposed via Edmodo where each work group has been assessed by getting marks for each task during the program. In some cases, groups got digital badges according to their efficiency and creativity in doing the task.

### *C. Development;*

Three unites from 10<sup>th</sup> grade level English curriculum have been redesigned under the umbrella of FRAM model and Task Based Language learning (TBL) framework. The six lessons plan included in the proposed program have been reviewed by two English teachers and three Professors. According to this revision, the researcher has made some modifications considering the experts' comments about the task types and procedures. After preparing and organizing all the materials on Edmodo platform, a pilot study was conducted in April and May 2014 in order to test the pedagogical, educational and technological aspects of the program. And since ADDIE model is a cycle design process, the researcher benefited from the pilot study results and returned to the design phase to improve the other lessons' plans in the light of the pilot study in the class; such as the potential benefits of creating a separate groups spaces in Edmodo for each group to facilitate private communication related to their own ideas to do the assignment, at the same time each group still had the opportunity to work in the general domain of the classroom on Edmodo; for instance, commenting on others' work, giving feedback or sharing a post. Moreover, results from the pilot study interviews have shed light on new aspects to be analyzed before implementing the main

experiment; such as adding the social applications to the program applications' list and contemplating students' knowledge about using mobile applications and dealing with the online platform. For that reason, the researcher prepared a training plan for the students including an introduction to the usage of google drive and Edmodo besides a guideline for choosing the best app, dealing with some technical problems and some rules to be followed in order to facilitate communication and classroom management during BYOD program. More details about all sessions plans and the Introductory sessions are found in Appendices J., K. The Introductory sessions have been approved by the school and the teacher. They took place in October 2015 in collaboration with Informatics teacher in the school who addressed two training sessions for the students in schools' computer laboratory to ensure better Internet connection and let all students try themselves how to save their files on google drive, how to share any file from google drive with others and how to download google drive app on their mobile devices and be familiar with its function. The researcher and the class teacher attended both sessions to support Informatics teacher and stay in touch with the updates.

#### D. *Implementation;*

The implementation of BYOD program started in November 2015. The proposed program comprised six lessons related to animals, life problems and Holidays. The setting and the devices used in the experiment consisted of a projector, wireless connection through the school network, a laptop and at least (14) mobile devices, belonged to students, with the installed proposed applications. The experiment lasted for 8 weeks (90 minutes per week). Various tasks have been completed each lesson supported by mobile technology, Internet connection and appropriate mobile applications. During this phase, the researcher role was an observer and Tech consultant, while the teacher played his role as a facilitator. See Figure (7). (More pictures of participants taking part in the program in Appendix S.



Figure 7: The teacher facilitates the collaborative work in groups

On the other hand, students were working actively in groups; interacting with each other, planning for their task, discussing their roles in the task and negotiating the best options to present and publish their work.

In the context of the weekly online assignment, the researcher and the teacher administered Edmodo platform and involved in all students' comments, posts and questions and addressed students' questions and problems as soon as possible besides sending reminder messages and encouraged students to submit their assignments in time.

#### *E. Evaluation;*

The evaluation has been carried out in two parts;

- Formative evaluation; where the researcher revised and checked out the adequacy of the whole program's instruction; such as the timeline for lessons' tasks, the learning strategy, the materials and recourses, the teacher adoption of the proposed technological integration, and how all were working in a group sitting. Formative evaluation was done through regular observation of all the lessons conducted by the researcher beside students' answers and comments on poll questions related to the lessons' topic which integrated on the social platform Edmodo.

Since the ADDIE Model is an iterative instructional design process, the results of the formative evaluation of each phase led the researcher back to any previous phase to make new adjustments aligned with that results.

- Summative evaluation; which conducted at the end of the program with the purpose of estimating the worth of the proposed content and strategy of BYOD program. The evaluation in this part focused on documenting students' reaction and attitude toward the program by administrating an anonymous survey encouraging the participants to reflect on their learning experience during the program (See sec. 3.7.3), besides conducting an open-ended interview to obtain students' feedback regarding the overall strengths and weaknesses of the program.

In addition, a specific interest has been addressed in the impact of the program on students' improvement in English skills and if there were any differences between the students who learned with BYOD program and those who learned with the traditional text book materials and traditional instructional strategy. For that reason, one to one English test was applied to all participants from both groups and the results were statically compared (See ch.4, sec. 4.3).

Another area that stimulated the researcher to explore was the impact of BYOD program on students' teamwork competencies since the program adopted small group collaborative learning strategy. Thus, TWC scale was administrated and the results from control and experimental groups were statically compared to verify any differences (See ch.4, sec. 4.4)

### **3.9 Pilot study**

Mackey and Gass (2005) state that “a pilot study is a small-scale trial of the proposed procedures, materials, and methods, and sometimes also includes coding sheets and analytic choices” (p. 43). They assert that a pilot study helps researchers revise and test the feasibility of the proposed methods, as well as expose problems and address them in the main trial. For the current research, two pilot studies were conducted; the first one was run from 10<sup>th</sup> April till 15<sup>th</sup> May 2014 with the aim of resolving any issues related to the program content and the activities design, participants, data collection, or data analysis in order to eliminate problems that may occur in the main study. The pilot study

resources were the participants' feedback, teacher's recommendations and the researcher's field notes. The adjustments and changes have been incorporated in the formal study. While the second pilot study directed in September 2015 in order to test and validate the instruments enabling the researcher to review and refine them before the main trial started.

### *3.9.1 Pilot study objectives;*

The purposes of the pilot study, which took place between 10<sup>th</sup> April and 15<sup>th</sup> May 2014, can be summarized in the following points:

- a. Explore student's learning with their mobile devices in the classroom.
- b. Train the teacher how to run the activities with mobile devices in the classroom.
- c. Test and develop the adequacy of the program design through exploring sample lessons.
- d. Identify the difficulties that might occur using the proposed program.
- e. Collect initial data.
- f. Develop the research questions and the research plan.
- g. Pilot the research instruments regarding the reliability issue

### *3.9.2 Pilot study participants*

The participants have been chosen from a secondary school in Florence, based on the school and the teacher enthusiasm and willingness to implement BYOD initiative in the classroom. The participants involved (20) students from the 10<sup>th</sup> grade, they divided into (13) female and (7) male students, aged (14-15), and their level of English is Intermediate.

### *3.9.3 Pilot study Procedures*

The pilot study split into three phases; a) Planning phase; b) Implementation phase and c) Evaluation phase. In the following, a description with more details about the researcher work in each phase:

a) *Planning phase*: Since the use of specific types of mobile devices such as mobile phone in Italian schools needs a formal permission, as students and teacher confirmed in the pilot survey, the pilot study started with getting a permission from the school administrator to let students bring their personal mobile devices to school in purpose of participating in the BYOD program activities and utilizing the wireless network at school. Two weeks before the study, the researcher sent the teacher some electronic materials related to the proposed program. One week prior starting the pilot study, the researcher and the teacher had a meeting and discussed about the following topics:

- The suggested mobile applications for the experiment: according to the planned learning activities, the researcher suggested some mobile apps to be exploited in the experiment and installed on students' mobile devices.
- How will the mobile devices be integrated into weekly classroom activities?
- The classroom management strategies: the researcher provided the teacher with a guide to help her with classroom management of different devices and activities.

The guide includes the responsible use policy that specifies when devices can be used, direct instruction on Internet safety and search strategies.

A week later, the pilot study started. The first meeting with participants was dedicated to introducing BYOD program and collaborative learning strategy for the participants and explore the proposed mobile applications. Besides, dealing with technical issues related to providing students with ID and password to access the school wireless network. At the end of the session, students were asked to complete an electronic survey designed by the researcher as a pre-study survey. Since the students did not have much experience using mobile devices for learning purposes, they were given time to familiarize themselves with the mobile apps by practicing assignments in unrelated topics. After one week, a reminder email was sent to all students to stimulate non-respondents to participate.

b) *Implementation phase*: The pilot program included four lessons related to music. Various learning activities supported by mobile technology have been designed, two to three mobile applications planned to be used for each lesson

according to a general plan for all the lessons and another intensive plan with details for each lesson. Regarding the number of tasks, two to three learning activities (tasks) were covered in each lesson, using students' mobile devices in order to improve collaborative learning among students. Table (5) summarizes the pilot study program activities with the utilized mobile apps and the type of students' performance. See Appendix L.

Table 5: Pilot study program

<b>The task</b>	<b>Mobile apps</b>	<b>Type of students' performance</b>
Generate new ideas	Mindmap app	Individual and collaborative learning
Vocabulary game	QR reader app	collaborative learning
Conversation	Voice recorder app & taking notes app	Individual and collaborative learning
Create a video	Video maker app & taking notes app	Individual and collaborative learning
Writing	Edmodo	Individual learning

c) *Evaluation phase*: after the completion of the program, students were asked to complete the post-study survey through the site, SurveyMonkey, and a week later, they were invited to participate in a feedback meeting (group focus interview).

#### 3.8.4 *The researcher role during the pilot study*

The researcher's role during the pilot study changed according to the phase;

- a) In the planning phase, the researcher worked as a designer for the lessons' activities.
- b) In the implementation phase, she acted as a facilitator, who provided technological and pedagogical support, besides being an observer, who

took notes as much as possible describing how students interacted, participated and reported each task.

- c) In the evaluation phase, she worked as an interviewer supported with the assistance of the teacher.

### 3.9.5 *The pilot study instruments*

- a. **The survey:** Two short surveys have been conducted prior and after the pilot study with different purposes; the prior survey aimed at gaining a better understanding of students' expectations using mobile devices for learning, the types of mobile devices they owned and preferred to bring to school. While the post survey sought to explore students' perspectives towards BYOD program regarding: (1) students' satisfaction. (2) students' ability to deal with the mobile apps. See appendices M., N.
- b. **Interview:** a focus group interview was conducted to collect qualitative data related to students' perspective toward the BYOD program. Focus group could provide information about a range of ideas and feelings that individuals have about certain issues, also Focus groups can generate large amounts of data in a relatively short time span (Rabiee, 2004a). The focus group interview followed steps that have been suggested by (Krueger & Casey, 2014); starting with (1) welcoming, (2) overviewing the topic, (3) grounding roles, then (4) opening questions.
- c. **Observation:** A class observation was used to collect data on students' interaction and activities. The observational notes were organized immediately after each lesson.

### 3.9.6 *Data analysis from the pilot study*

In this section, the researcher describes the data collected from the participants in the pilot study. This section will be descriptive in nature, since the main goal of the pilot study is a trial of the feasibility of the main study. Problems that encountered during the pilot study will be discussed, and how to eliminate them in the main study.

a) Pilot survey

The results from pre-pilot study survey obviously showed that students held high expectation for using their mobile device to access digital resources in the first place (58.33%) and to collaborate with their classmates secondly (33.33), while submitting their work to the teacher and being more engaged came in the third place (8,33). Regarding the mobile devices that they can bring to school and use them for learning, the majority of students chose a smart phone (46.15%), followed by Tablet Android (38.46%) and iPad at the last choice (15.38%). A remarkable result was that all the students (100%) brought their smart phones to school but the school limits their usage. They could be used just under the supervision of the teacher when he gave students the permission to use them. However, students could use Tablet Android and iPad for learning purposes when they want. Moreover, results revealed that all the students have Internet access at home, so no worries about students' ability to contact with their teacher and other classmates through Edmodo when they come back home in order complete any activity and submitting their homework or even ask for assistance. All of those results were taken into consideration during the implementation and evaluation phases of the study.

The post- pilot study survey revealed that (88,89%) of students like the idea of exploiting their mobile devices during the lesson for doing the learning tasks, while (11,11%) still have kind of hesitation about this new strategy. Those students stated in the focus group interview that they need more information and explanation about the benefit from integrating mobile technology in their classroom. Additionally, (87,50%) of students stated that using mobile devices to do the learning tasks makes the learning more interesting, while (12,50%) of students strongly agreed with this point and they were so enthusiastic about the new experiment. However, (66,67%) of students declared that they know how to use their mobile devices properly, which gives as a sign that (33.33%) of students still need some guiding and support to help them complete their learning tasks during the program, especially in using Edmodo platform and sharing files through goggle drive.

b) Data from interview: (gathering all results together and remove the questions)

To analyze the qualitative data collected from the interview, three steps have been conducted: (1) transcribing the data, (2) coding the data, and (3) finding main

themes. Results from the first question, **Q1**: Can you describe how learning in this program differs from learning normally (traditionally), revealed that students found the learning more interesting, more engaging and they can be more productive, they declare that time was passing quickly. Moreover, students felt that they are responsible for their learning and each lesson they have something to accomplish before the end of the lesson.

Regarding the answers from the second question, **Q2**: What do you like best about the program? students stated that they like creating videos using their devices, sharing their work with others and see others work. In addition, they like recording the interviews with their classmates.

Concerning students reflect on the third question, **Q3**: Could you tell me about the difficulties you faced during the program, they faced different kind of challenges, the most noticeable one related to the technical issues; problems with wi-fi connection, uploading their work to Edmodo blog, short device battery life and limited memory storage in their devices. While others stated that they need training to exploit mobile devices in their learning properly. Besides, some of them claim that they found it difficult managing their account on Edmodo blog and they prefer using Facebook or What's up instead. Finally, students gave some recommendation according to the fourth question, **Q4**: What do you recommend for improving this program? they emphasized the necessity to train students using different mobile apps, offering mobile devices to students in a case that their devices stopped suddenly.

#### c) Data from observation

The researcher has reached some practical guidelines throughout the observation in the classroom and tracing the students posts online on Edmodo;

- Clarifying the objectives and the procedure to students was essential to guarantee to attain the activity's outcome.
- A non-reliable Internet connection was considered the main difficulty that faced the student during the program, and in a few cases, it was the most considerable obstacle tackled the students to complete the activity by uploading their work online and share it with other students.

- Students should be informed of the assessment criteria for each activity in advance (e.g. length of speech, coherence, linguistic accuracy) to assure a good quality work from the students.
- The teacher should provide the students with adequate but not redundant assistance.

### 3.10 Data analysis

This study utilized means and standard deviations with independent and dependent samples t tests for the analysis because they are convenience methods to evaluate differences between two groups and for each group before and after the experiment. Moreover, the Coefficient of determination ( $r^2$ ) was applied to calculate the effect size which allows the researcher to measure the magnitude of mean difference. The researcher converted t value to ( $r^2$ ), by using the formula:  $r^2 = t^2 / (df + t^2)$ , Where t is the t-test and df is the degrees of freedom. Values of (0.01 to 0.09) interpret as a small effect, a medium effect (0.10 to 0.25), and over (0.25) represent a large effect (Acock, 2016, p.189)

The mean measures the central tendency, and standard deviation measures the extent to which the scores deviate from the mean. Besides different types of t-test; dependent t-test was used to compare the score from the pretest and post-test for the treatment group and the control group separately using the formula:

$$\text{Dependent } t\text{-test} = \frac{\bar{D}}{\sqrt{\frac{\sum D^2 - \frac{(\sum D)^2}{N}}{N(N-1)}}$$

Where D bar is the mean difference between two samples, N is the sample size and t is a paired sample t-test with N-1 degrees of freedom.

While the independent t-test is demonstrated to test if the treatment and control means were significantly different from each other using the formula:

$$\text{Independent } t\text{-test} = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

where x bar 1 and x bar 2 are the sample means,  $s^2$  is the pooled sample variance,  $n_1$  and  $n_2$  are the sample sizes and t is a Student t quantile with  $n_1 + n_2 - 2$  degrees of freedom

(Martin & Bridgmon, 2012, p.25-26)

This analysis facilitated addressing research question number one Q1 concerning students who learned through the BYOD program supported with collaborative group work strategy compared to students learned traditionally in classroom in regard to their English skills, and H01, which stated that there is no statistically significant difference in EFL test mean scores between the experimental group and the control group. Each null hypothesis, suggesting no statistically significant difference in the mean scores between the two groups, were tested by conducting an independent samples t test using RStudio package version 3.2.3 to accept or reject each one. A minimum significance level of  $p < .05$  means that the differences considered statistically significant if the percentage of occurring those differences by chance is less than 5%. By using pre-and post-test scores, the researcher could compare and measure the scores to check the hypothesis.

Likewise, addressing research question number two Q2 concerning students who learned through the BYOD program supported with collaborative group work strategy compared to students learned traditionally in classroom in regard of their group work competencies, and H02, which stated there is no statistically significant difference in mean scores on group work competences scale between the experimental group and the control group.

However, addressing research question number three Q3, which concerning students' perspectives of BYOD program with the collaborative learning strategy, has required a descriptive statistical analysis included means and standard deviations with inferential statistics. Besides, more qualitative data collected throughout the interviews with the students.

Verifying the third hypothesis H03 which stated that there is no statistically significant difference in students' mean scores on a perspective survey between F2F and virtual collaboration strategies, required conducting a dependent t-test to compare the mean score of treatment group between F2F and virtual collaboration strategies.

Answering the fifth and the sixth question research question Q5, Q6 which dealing with advantages and limitation of the program and managing the group work, has been done by analyzing the information collected through the interviews. The data from all transcribed interviews have been analyzed by using inductive coding process to clarify student groups' experience with their BYOD program. Coding alludes to “the

identification of topics, issues, similarities and differences that are revealed through participants' narratives and interpreted by the researcher" (Sutton & Austin, 2015, 228). The codes and categories have been extracted manually from the analytical process. The codes were directly mentioned and named by the interviewee. Categories were also created to express commonalities among groups of codes by assigning labels that summarize the data in a short phrase, then converted into individual textual descriptions reflected each group experience with their BYOD program concerning the interview questions (Bikner-Ahsbals, Knipping, & Presmeg, 2015). Then, a table was developed that displays the development of codes' frequency based on students' responses to each question. (See Appendix O)

### **3.11 Ethical Consideration**

Ethical issues should be considered from the research design phase till writing and publishing the results. Brooks et al. (2014) confirm that not only the informed consent is essential, but also persistent ethical reflection during the research process (p.3). Hence, the researcher sought permission from the school head Ministry to conduct the study first and consult the teacher about the suitable content from student 'text book to be redesigned according to the proposed strategy. Moreover, students and teachers participated in this study were notified of the nature of the experiment and its procedures, then they chose to take part in it voluntary. Consequently, they signed a detailed informed consent document for participation in the research. Furthermore, students who did not bring their ownership devices were given exactly the same opportunities as those who did. Since the program is not 1:1 computing initiative and the students encouraged to share their devices and work collaboratively, so that no student was disadvantaged.

Furthermore, the permission to proceed the research stipulated several conditions which had to be met including that the identities of the participants were not to be recognized. Therefore, in the writing phase of the research, the photo images and surnames of the participants were wiped out in order to protect their identities. Likewise, the anonymity of participants was always maintained. All the collected data in this study; such as the recordings made during the interviews to guarantee the accuracy, tests scores and survey results, were safely secured by the researcher and will be completely ruined after all.

## CHAPTER 4

### ANALYSIS OF DATA

*“A little knowledge that acts is worth infinitely more than much knowledge that is idle.” Khalil Gibran*

#### **Introduction**

The following chapter contains a restatement of the study’s questions and hypothesis, besides the results for each research question. Data were collected from September 15, 2015, through February 1, 2016. Results of both quantitative and qualitative data collection for the study are described in this chapter.

#### **4.1 Restatement of Research Questions:**

The following serve as the research questions for the study:

**Q1.** To what extent is there a difference in EFL achievement between students who learn according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods?

**Q2.** To what extent is there a difference in group work competencies between students who learn according to BYOD approach supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods?

**Q3.** What are students' perspectives of BYOD program with the collaborative group work strategy?

**Q4.** Is there a difference in students’ perspective between F2F and virtual collaboration strategies?

**Q5.** How do students in the experimental group manage the group work?

**Q6.** What do students consider to be the main advantages and limitations of BYOD program supported with collaborative group work strategy?

#### **Research Hypotheses**

To verify whether the BYOD program provides benefits in terms of learning performance in English and group work competencies, the study encompassed the following null hypotheses:

H<sub>0</sub>1: There is no significant difference between the mean FFL test scores of students learning according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods.

H<sub>0</sub> 2: There is no significant difference between the mean TWC test scores of students learning according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods.

H<sub>0</sub> 3: There is no significant difference between students' mean scores on perspective survey towards F2F collaboration compared to and virtual collaboration.

#### 4.2 The Awareness and Usage of Mobile Technology

The researchers created a pre-survey online aimed at gathering information on students' mobile ownership and their knowledge of using the mobile apps involved in the proposed BYOD program before starting. Twenty-five students completed the pre-survey which consists of multiple choice format questions.

The first question asked students to identify the type of mobile device they owned and preferred to bring to school. Approximately 68% of students indicated they owned and preferred a mobile phone, 20% stated that they owned and preferred an iPad, 12% reported that they owned and preferred an Android tablet. See Figure (8)

The second question investigated if the students have utilized their mobile devices in the

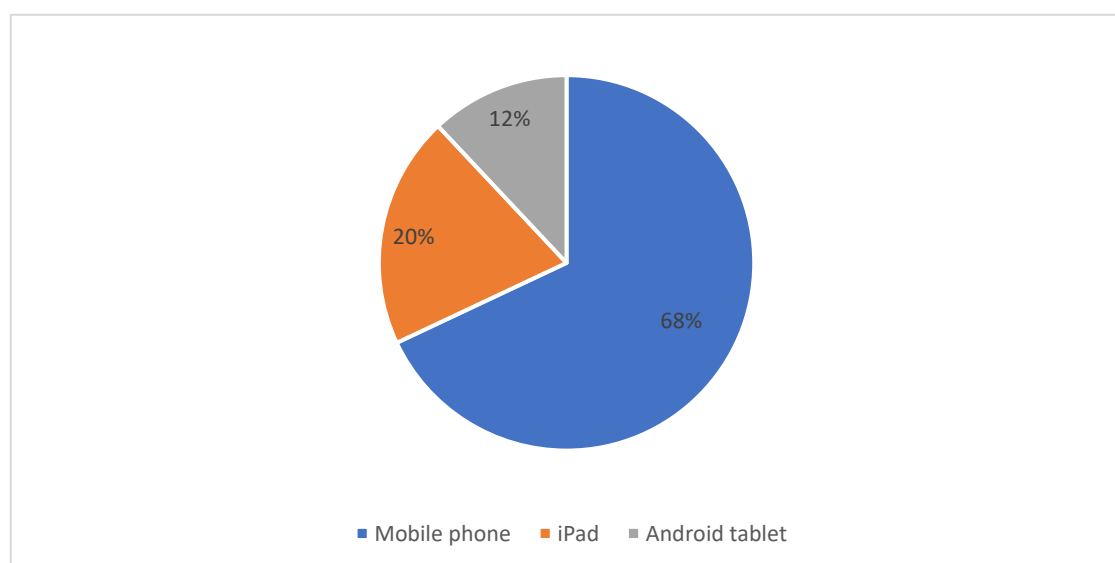


Figure 8: The type of students 'mobile devices classroom before for educational purposes. Around 64% of students declared that they

have never brought their mobile devices to the classroom for educational purposes, while 36% of students in the present study have used their devices at least once to support their learning.

The third, fourth and fifth questions explored students' awareness of cloud features since the proposed program relied on Google drive. The questions highlighted students' ability to utilize Google drive in saving files, sharing documents and accomplishing a learning task. Nearly 60% of the students pointed out that they did not know how to save files to google drive and 54% of students stated that they did not know how to share files from google drive with other people. Additionally, 88% of the students had not used this cloud before to accomplish a learning task. In contrast 40%, 46%, 12% of the students answered with yes on the third, fourth and fifth questions respectively. See Figure (9)

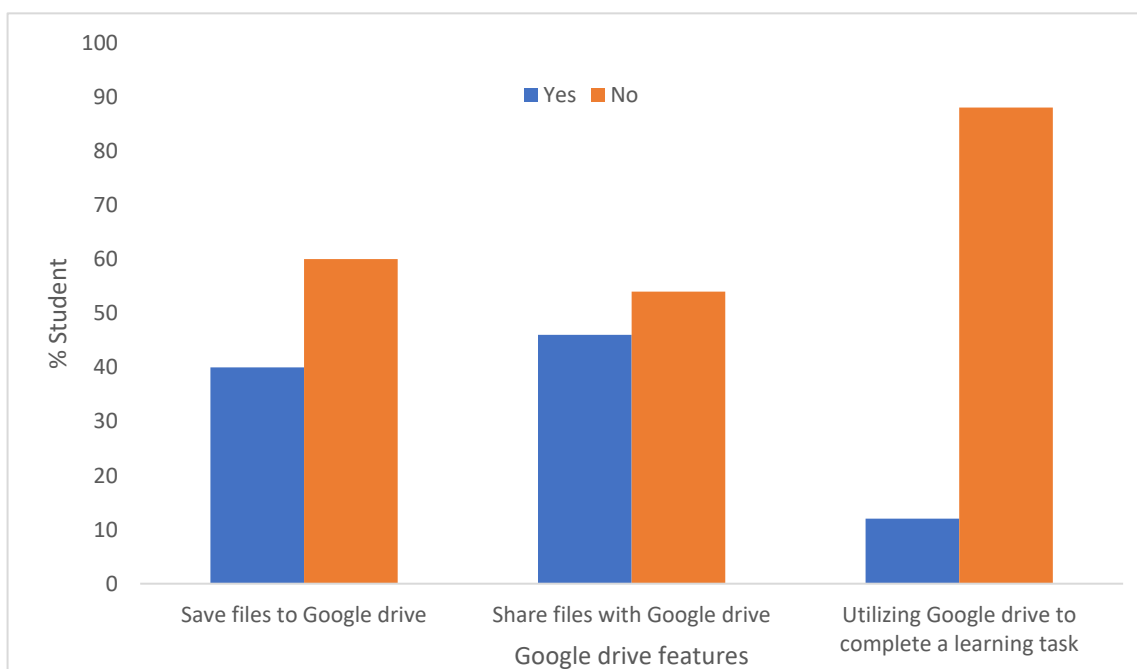


Figure 9: Students' awareness of Google drive features

The sixth question investigated whether the students knew some of the mobile apps employed in the proposed BYOD program in the current study. The apps were;

- Edmodo: Nearly 36% of the students answered with yes, while 64% answered with no.
- QR reader: Around 44% of the participants said yes though 56% answered with no.

- QR generator: 36% of the students know this app. Conversely, 64% stated that they did not.
- Note taking: About 40% of the students answered with yes. In return, 60% said no.
- Mindmap: Only 6% of the participants stated that they knew this app. On the other hand, 94% answered with no.
- Voice recorder: 12% of the students know this app, while 88% answered with no.
- Padlet: Only 8% of the students answered with yes. By contrast, 92% did not know this app.
- Video maker: Approximately 52% % of the students know this app. Conversely, 48% said they did not.
- YouTube: the majority 92% declared “yes” they know this app, while 8% answered with no. See Figure (10)

The seventh question asked students if they had used some of the mobile apps in the classroom for learning purposes. The apps were:

- Edmodo: Around 20% of the participants stated that they had worked with Edmodo for learning purposes. In contrast, 80% had never used Edmodo in the classroom before.
- QR code app: One hundred percent of the students in this study approved that they have used neither QR code reader app nor QR code generator app in a classroom.
- Note taking app: Much the same one hundred percent of the students in this study said that they had never used Note taking app code app in a classroom before.
- Mindmap: Only 4% of the students declared that they had used this app for learning purposes before, while the majority 96% answered with no.
- Voice recorder: 16% of the student approved that they had utilized Voice recorder in the classroom. By contrast, 84% had never used this app in a classroom before.
- Padlet: One hundred percent of the student said that they had never utilized Padlet

app in a classroom before.

- Video maker: 8% of students reported that they had used the app in the class while approximately 92% of the students have never utilized it for learning.
- YouTube: Similar to Mindmap app just 4% of the students declared that they had used this app for learning purposes before, while the majority 96% answered with no.

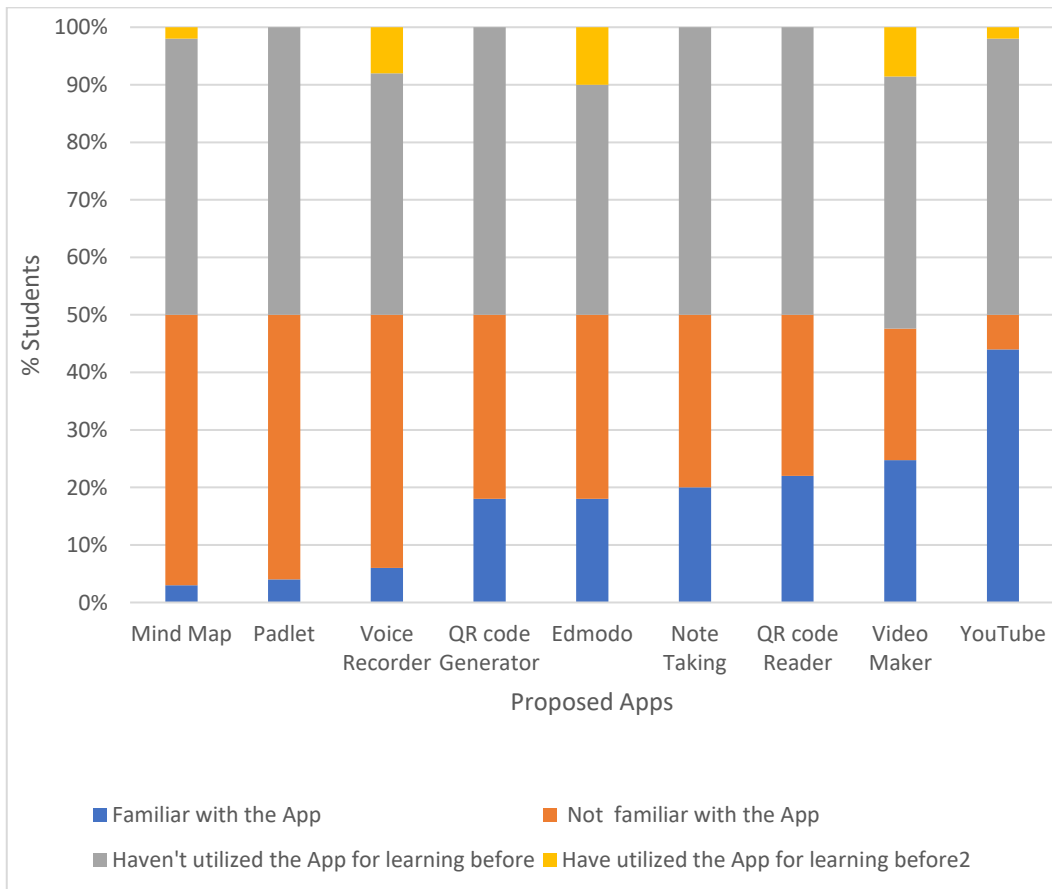


Figure 10: Students' awareness of the proposed applications

### 4.3 Research Question 1 Results: Academic Achievement

To explore the BYOD program impact on students' achievement in English as a foreign language(EFL), the researchers applied a test that lasted 60 minutes and consisted of five sections; (a) Reading, (b) Grammar, (c) Listening, (d) Writing and (e) Speaking. Each part comprised five questions with 20 points in total. The overall maximum score was 100. The test was applied twice; before and after the experiment. For the analysis, means

and standard deviations with paired samples t-test to compare results from the same group, while means and standard deviations with Independent-samples t-tests were used to compare results from different groups. The mean measures of central tendency and standard deviation measure the extent to which the scores deviate from the mean. This analysis facilitated addressing the first null hypothesis ( $H_0$ ) which stated that There is a significant difference between the mean FFL test scores of students learning according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional course and methods. A minimum significance level of  $p < .05$  meant that the differences were statistically significant if those differences occurred by chance fewer than five times out of 100.

According to the descriptive statistics of the pretest of the pre-test for the experimental and the control groups, the control group scored higher (mean = 75.95) than the experimental group (mean = 74.23). However, examining the mean score differences between the two groups an independent t-test using RStudio showed that there is no statistically significant difference in EFL test mean scores between the experimental group and the control group before starting BYOD program. (p-value (0.567) > 0.05). Table (6) below shows the results of the independent t-test for both groups.

Table 6: Results of the Independent -Test (Pre-test): Control Group and Experimental Group regarding the EFL test

<b>Group</b>	<b>Test</b>	<b>N</b>	<b>Max.</b>	<b>Min.</b>	<b>M</b>	<b>SD</b>	<b>t</b>	<b>df</b>	<b>p</b>
Control	Pre	20	95	58	75.95	10.36	0.576	39.296	0.567
Experimental	Pre	26	91	54	74.23	9.58			

*N: sample size for each group*

At the end of BYOD program, a paired-sample t-test was applied to test the distinction in the mean scores between the pre-test and post-test for each group and check the significant differences in EFL achievement within the groups. The following Table (7) shows the results of the difference in mean scores between pre- and post-tests for the control group and Table (8) represents the results for the experimental group. As showed in Table (7), the mean of the pre-test scores of the control group (M=75.95, SD= 10.36) was significantly different from the mean of the post-test scores (M=81, SD=9.68). In

other words, the control group showed significant improvement in the EFL test ( $t= 9.79$ ,  $p= 4.821e-10$ )

Table 7: Results of the Paired-sample t-Test: Control Group regarding the EFL test

<b>N=20</b>	<b>Test</b>	<b>Max.</b>	<b>Min.</b>	<b>M</b>	<b>SD</b>	<b>t</b>	<b>df</b>	<b>p</b>
Control group	Pre	95	58	75.95	10.36	4.1344	19	.0005637***
	Post	98	66	81	9.68			

\*\*\*  $P < .01$

Moreover, in the case of the experimental group, the mean of the pretest scores ( $M=74.23$ ,  $SD=9.58$ ) was also significantly different than the mean of the post-test scores ( $M=86.88$ ,  $SD=9.05$ ,  $t= 9.79$ ,  $p= .0005637$ ), as shown in Table (8) below. That is, the students in the experimental group also made a significant improvement in the English post-test at the end of BYOD program.

Table 8: Results of the Paired-sample t-Test: Experimental Group regarding the EFL test

<b>N=26</b>	<b>Test</b>	<b>Max.</b>	<b>Min.</b>	<b>M</b>	<b>SD</b>	<b>t</b>	<b>df</b>	<b>p</b>
Experimental group	Pre	91	54	74.23	9.58	9.79	25	4.821e-10***
	Post	98	64	86.88	9.05			

\*\*\*  $P < .01$

The test results revealed that both groups (experimental and control groups) had reached significant improvement in the post-test at the end of BYOD program. However, the Coefficient of determination ( $r^2$ ) for calculating the effect size which allows as to measure the magnitude of mean difference revealed that size effect of scores from pre-post test of the experimental group is ( $r^2 = 0.793$ ) which considered as a large size effect since ( $r^2 > 0.25$ ) (see ch.3, sec.3.10) and that was bigger than the size effect of scores from pre-post test of the control group ( $r^2 = 0.6$ ).

This examination of differences between the two groups regarding their English skills development at the end of the program would reveal whether the proposed BYOD program with collaborative group learning would be more effective than traditional

classroom learning in developing participants' English skills. Thus, independent t-tests were conducted to establish whether the differences in mean scores between the pre- and post-tests of both groups were significantly different. As shown in Table (9) below, the mean of the post-test scores of the control group (M=81, SD=9.68) was significantly different from the mean of the post-test scores of the experimental group (M=86.88, SD=9.05,  $t = -2.101$ ,  $p = .042$ ). In other words, the mean of the pre-post-test score difference for the participants in the experimental group was significantly higher than the control group. Therefore, the results verified that the experimental group outperformed the control group regarding developing students' English skills. Thus ( $H_01$ ) was rejected. On the other hand, the size effect of scores from pre-post test of the experimental group was ( $r^2 = 0.103$ ) which considered as a medium size effect since ( $r^2 > 0.09$ )

Table 9: Results of the Independent -Test (Post-test): Control Group and Experimental Group regarding the EFL test

Group	Test	N	Max.	Min.	M	SD	t	df	p
Control	Post	20	98	66	81	9,68	-2.101	39.557	.042*
Experimental	Post	26	98	64	86.88	9,05			

\* $p < .05$ , N: sample size for each group

To sum up, this study's finding has shown that proposed program which involved the use of students' mobile devices with collaborative group learning for EFL was beneficial with a large size effect for facilitating the development of learners' English skills. It is worth noticing that adopting of BYOD program for EFL learners proved to be more efficient than the traditional English classroom.

#### 4.4 Research Question 2 Results: Teamwork Competencies

To answer the second research question: To what extent is there a difference in group work competencies between students who learn according to BYOD approach supported by collaborative group work strategy compared to students learning according to the standard textbook and methods?

The researcher adopted TWC scale from (Aguado et al., 2014) to estimate students' teamwork competencies (TWC). The scale used a 4-point response of frequency

(1 = never/almost never till four = always/almost always). The scale included (30) items, hence the lowest score may students got on this test was (30) while the highest one was (120). It involved five transportable group work competencies; (1) Conflict resolution, (2) Collaborative problem solving, (3) Communication, (4) Goal setting and performance management, (5) Planning and task coordination. The scale was applied to the experimental and control group twice; before and after the BYOD program to compare the difference in impact between BYOD program and the traditional program on students' teamwork competencies. For the analysis, means and standard deviations with paired samples t-test to compare results from the same group, while means and standard deviations with Independent-samples t-tests were used to compare results from different groups. This analysis facilitated addressing the second research question Q2 concerning the impact of BYOD program with collaborative group strategy on students' teamwork competencies compared to the traditional curriculum and learning strategy in the classroom; Second null hypothesis ( $H_02$ ) which stated that there is no statistically significant difference in mean scores on workgroup competencies scale (TWC) between the control and experimental groups.

An independent t-test using RStudio was conducted to make sure whether the control group and the experimental group shared the same average level of teamwork competencies before they participated in this study. The mean scores of the pre-test for both groups were analyzed. According to the descriptive statistics of the pretest, the control group scored higher ( $M = 89.85$ ) than the experimental group ( $M = 88.76$ ). In examining the mean score differences between the experimental and control groups, the t-test procedure indicated there was no significant difference between the two groups regarding their average level of teamwork competencies before they start the program ( $p\text{-value } (0.645) > 0.05$ ). Table (10) below shows the results of the independent t-test for both groups

Table 10: Results of the Independent -Test (Pre-test): Control Group and Experimental Group regarding TWC scale

<b>Group</b>	<b>Test</b>	<b>N</b>	<b>Max.</b>	<b>Min.</b>	<b>M</b>	<b>SD</b>	<b>p</b>
Control	Pre	20	103	77	89.85	8.08	.645
Experimental	Pre	26	103	75	88.76	7,53	

*N: sample size for each group*

The difference in the mean scores between the pre-test and post-test for each group was tested with a paired-sample t-test to verify whether there was any significant difference in teamwork competencies within the groups at the end of BYOD program, Table (11) shows the results of the difference in mean scores between pre- and post-tests for the control group while Table (12) shows the results for the experimental group. As shown in Table 11 below, the mean of the pretest scores of the control group (M=89.85, SD= 8.08) was not significantly different from the mean of the post-test scores (M=91.25, SD=7.55). In other words, the control group showed no significant improvement in team work competencies (p-value (0.577) > 0.05)

Table 11: Results of the Paired-sample t-Test: Control Group regarding TWC scale

<b>N=20</b>	<b>Test</b>	<b>Max.</b>	<b>Min.</b>	<b>M</b>	<b>SD</b>	<b>p</b>
Control group	Pre	95	58	89,85	8.08	.577
	Post	105	79	91,25	7,55	

In the case of the experimental group, the mean of the pretest scores (M=88.76, SD=7.73) was significantly different from the mean of the post-test scores (M=99,80, SD=2.93, p= 1.369e-06), as shown in Table (12) below. That is, the students in the experimental group made a significant improvement in teamwork competencies post-test at the end of BYOD program.

Table 12: Results of the Paired-sample t-Test: Experimental Group regarding TWC Scale

N=26	Test	Max.	Min.	M	SD	p
Experimental group	Pre	103	75	88.76	7.53	1.369e-
	Post	106	93	99.80	2.93	06 ***

\*\*\*  $P < .01$

The scale results revealed that students in the experimental group showed significant improvement in the post-test at the end of BYOD program. Further, the Coefficient of determination for calculating the effect size ( $r^2$ ) which allows as to measure the magnitude of mean difference revealed that size effect of scores from a pre-post test of the experimental group is ( $r^2 = 0.613$ ) which considered as a large size effect since ( $r^2 > 0.25$ ).

Next, the scholar examined whether there were statistically significant differences between the two groups at the end of the study regarding their mean scores on TWC scale to verify ( $H_02$ ). This examination would reveal whether the proposed BYOD program with collaborative group learning would be more efficient than relying on the standard textbook and traditional learning strategy in developing learners' teamwork competencies. Thus, independent t-tests were conducted to establish whether the differences in mean scores between the post-tests of both groups were significantly different. As shown in Table (13) below, the mean of the post-test scores of the control group ( $M=91.25$ ,  $SD=7.55$ ) was significantly different from the mean of the post-test scores of the experimental group ( $M=99.80$ ,  $SD=2.93$ ,  $p= 7.393e-05$ ). In other words, the mean of the post-test score for the participants in the experimental group was significantly higher than the mean of the post-test score for the control group. Therefore, the results verified that the experimental group outperformed the control group regarding developing students' teamwork competencies. Thus, the second null hypothesis ( $H_0 2$ ) was rejected. On the other hand, the size effect ( $r^2$ ) of scores from a pre-post test of the experimental group was ( $r^2 = 0.495$ ) which considered as a large size effect since ( $r^2 > 0.25$ ).

Table 13: Results of the Independent -Test (Post-test): Control Group and Experimental Group regarding TWC scale

<b>Group</b>	<b>Test</b>	<b>N</b>	<b>Max.</b>	<b>Min.</b>	<b>M</b>	<b>SD</b>	<b>p</b>
Control	Post	20	105	79	91.25	7.55	7.393e-05 ***
Experimental	Post	26	106	93	99.80	2.93	

\*\*\* $p < .01$ , N: sample size for each group

Finally, the scholar examined whether there were statistically significant differences between the two groups regarding their score in each category of TWC scale (Conflict resolution, Collaborative Problem Solving, Communication, Goal setting and Performance Management, Planning and Task Coordination). Thus, an independent t-test was conducted on the post-test TWC scale mean scores on each category for both groups. This examination would reveal which category of teamwork competencies was significantly improved because of the proposed BYOD. For the first category of competencies of TWC (Conflict Resolution). The researcher conducted an independent t-test on the post-test of this category. As shown in Table (14) below, the mean of the post-test scores of the control group (M=18.45, SD=2.06) was significantly different from the mean of the post-test scores of the experimental and control groups on the conflict resolution competencies (M=20.64, SD=1.31,  $p = .0002376$ ), so there is a significant difference in the mean of the post-test scores of the experimental and control groups on the conflict resolution competencies.

Table 14: Results of the Independent -Test (Post-test): Control Group and Experimental Group regarding Conflict Resolution

<b>Category</b>	<b>Group</b>	<b>Test</b>	<b>N</b>	<b>Max.</b>	<b>Min.</b>	<b>M</b>	<b>SD</b>	<b>p</b>
Conflict Resolution	Control	Post	20	23	14	18.45	2.06	.0002376***
	Experimental	Post	26	23	18	20.64	1.31	

\*\*\* $p < .01$ , N: sample size for each group

Another independent t-test was conducted on the post-test of the second category of TWC

scale (Collaborative Problem Solving). As shown in Table (15) below, the mean of the post-test scores of the control group (M=20.55, SD=1.84) was significantly different from the mean of the post-test scores of the experimental group on the Collaborative Problem-Solving competencies. (M=21.92, SD=0.98,  $p= 0.007316$ ), Thus, there is a significant difference in the mean of the post-test scores of the experimental and control groups on the Collaborative Problem Solving.

Table 15: Results of the Independent -Test (Post-test): Control Group and Experimental Group regarding Collaborative Problem Solving

Category	Group	Test	N	Max.	Min.	M	SD	<i>p</i>
Collaborative Problem Solving	Control	Post	20	24	17	20.55	1.84	.007316***
	Experimental	Post	26	23	19	21.92	0.98	

\*\*\* $p < .01$ , *N*: sample size for each group

For the third category of competencies of TWC scale (Communication), the researcher conducted an independent t-test on the post-test of this category. Table (16) showed that there was no significant statistical difference between the mean of the post-test scores of the control group (M=18.85, SD=2.39) and the mean of the post-test scores of the experimental group (M=20.07, SD=0.98,  $p= 0.06418$ ) on the Communication competencies, Therefore, there is no significant difference in the mean of the post-test scores of the experimental and control groups on Communication competencies.

Table 16: Results of the Independent -Test (Post-test): Control Group and Experimental Group regarding Communication

Category	Group	Test	N	Max.	Min.	M	SD	<i>p</i>
Communication	Control	Post	20	23	14	18.85	2.39	.06418
	Experimental	Post	26	22	18	20.07	0.98	

The next independent t-test was conducted on the post-test of the fourth category of TWC scale (Goal setting and Performance Management). As shown in Table (17) below, the average of the post-test scores of the control group (M=15.95, SD=2.70) was significantly different from the mean of the post-test scores of the experimental group (M=20.07, SD=1.39,  $p=0.007316$ ) on the Goal sitting and Performance Management Competencies. Thus, Therefore, there is a significant difference in the mean of the post-test scores of the experimental and control groups on Goal setting and Performance Management.

Table 17: Results of the Independent -Test (Post-test): Control Group and Experimental Group regarding Goal setting and Performance Management

Category	Group	Test	N	Max.	Min.	M	SD	<i>p</i>
Goal sitting and Performance Management	Control	Post	20	23	12	15.95	2.70	.0008586 ***
	Experimental	Post	26	21	15	20.07	1.39	

\*\*\* $p < .01$ , N: sample size for each group

The last independent t-test was conducted on the post-test of the fifth category of TWC scale (Planning and Task Coordination). Table (18) showed that there was no significant statistical difference between the mean of the post-test scores of the control group (M=18.85, SD=2.39) and the mean of the post-test scores of the experimental group (M=20.07, SD=0.98,  $p=0.06418$ ) on the Planning and Task Coordination competencies. Therefore, there is no significant difference in the mean of the post-test scores of the experimental and control groups on Planning and Task Coordination.

Table 18: Results of the Independent -Test (Post-test): Control Group and Experimental Group regarding Planning and Task Coordination

Category	Group	Test	N	Max.	Min.	M	SD	<i>p</i>
Planning and Task Coordination	Control	Post	20	21	14	15.95	2.70	.06525
	Experimental	Post	26	22	15	18.68	1.95	

#### 4.5 Research Question 3 Results: Students' Perspective towards BYOD program

At the end of the program, students from the experimental group have responded to a 30 item five-point Likert scale in order to explore their attitude towards the learning experience throughout the proposed BYOD program (See Appendix E). The survey covered students' attitude according to four dimensions; (a) Collaborative group work in class, (b) Virtual collaborative group work; (c) Learning with a wireless connected mobile device; (d) Learning with mobile apps.

Cronbach's alpha reliability coefficient of (.87) was gained from the pilot study for this survey. The data from this survey analyzed by calculating the average score and standard deviation for each participant. The survey result was summarized in Table (19) below.

Table 19: The survey results of students' perceptions toward BYOD program with collaborative group learning for developing English skills

Survey Questions	Mean	SD
<b>With face to face collaboration in class:</b>	<b>4.28</b>	<b>0.44</b>
1. It is easy to collaborate with my teammates in order to complete our task.	4.5	0.50
2. I collaborate effectively with my teammates to submit our work on time.	4.46	0.58

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3. I like to continue face to face collaboration in groups to learn the other subjects.	3.36	0.72
4. I do not have a problem to communicate with my teacher.	4.15	0.36
5. I do not have a problem with sharing my ideas with my group mates.	4.46	0.58
6. I am satisfied with my performance in my group during the tasks.	4.30	0.47
7. I like face to face collaboration in teams.	4.73	0.45
<b>With virtual collaboration in groups:</b>	<b>4.15</b>	<b>0.07</b>
8. It is easy to collaborate with my teammates in order to complete our task.	4.19	0.49
9. I am motivated to collaborate virtually with my teammates and submit our work on time	4.19	0.49
10. I like to continue virtual collaboration in groups to learn the other subjects.	4.03	0.72
11. It is easy to communicate with my teacher virtually.	4.07	0.56
12. I can share my ideas with my group mates throughout the Internet.	4.19	0.40
13. I am satisfied with my performance in my group during the tasks.	4.15	0.46
14. I like the idea of collaborative learning with my group mates virtually through the Internet.	4.26	0.66
<b>Learning with a Wi-Fi connected mobile device:</b>	<b>4.10</b>	<b>0.13</b>
15. Makes me updated with my group mates and classmates progress.	4.15	0.54
16. Improves my technical skills.	4.11	0.86

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17. Helps me to learn effectively.	3.96	0.59
18. I like to use my mobile device for learning the other subjects.	4	0.69
19. I appreciate the opportunity to employ my mobile device in my learning.	4.30	0.47
<b>Educational mobile applications</b>	<b>3.99</b>	<b>0.19</b>
20. Help me to organize my ideas.	4.19	0.40
21. Help me to share and save my homework.	4	0.56
22. Help me to receive feedback and constantly monitor my progress.	3.84	0.61
23. Help me to communicate with my teacher.	4.03	0.72
24. Help me to present my work differently.	4	0.48
25. Help me to share my work with other groups in class.	3.76	0.42
26. Help me to create my learning materials and be more productive.	4.46	0.50
27. help me improve my conversation and listening skills.	3.96	0.77
28. Help me to learn from another groups' work.	4.03	0.59
29. They are effective for real-time communication and collaboration.	3.80	0.56
30. Help me to search for new information.	3.92	0.53

As shown in Table (19), The mean values of participants' responses to their perceptions of the learning experience (calculated against the 5-point Likert scale) were above 4.0 in three aspects of the survey. These outcomes revealed that students have an overall positive perspective and attitude toward BYOD program and collaborative learning strategy. To examine the results in detail, survey items 1 and 7, that concern the effectivity of face to face group collaboration in classroom to accomplish the learning task, have shown the

highest mean scores (M=4.5, M=4.73)

Regarding the students' perspective toward the benefits of mobile apps in developing their learning, the last dimension of the survey "Educational mobile applications" reflects many positive attitude, starting with the item 26 which showed the highest mean scores comparing to the other items in this dimension (M=4.46, SD= 0,50) and present the advantage of mobile apps in creating special learning materials (audios, videos) and making the students more productive.

In addition, it was apparent that participants in this study positively evaluated the integration of mobile devices and mobile apps for learning purposes; for instance, in item 19, (100%) of students answered strongly agree/agree with (M=4.30, SD=0,47) that they appreciated the opportunity to employ their mobile device in learning. In item 13, (96.15 %) of students answered either "strongly agree" or "agree" with (M=4.15, SD=0,46) that they were satisfied with their performance in the group during the tasks.

Further to the data collected from the students' perspective survey, more information was gathered through the interviews and the researcher field notes. The researcher conducted group interviews with participates. The analysis process included listening to the interview records, reading transcripts, extracting the codes and related categories.

The first category from the coding plan "BYOD program's specialties compared to traditional learning" summarized the answer. (See Appendix O). The first category from the coding plan "BYOD program's specialties compared to traditional learning" summarized the answer. (See Appendix O). The learners approved that the program was a novice and utilizing their mobile devices has motivated them.

Furthermore, the field note reflects students' enthusiasm and their willing to adapt to the new learning atmosphere. The researcher pointed out in her observation diary;" By the beginning of each session, students were switching on the class laptop, replacing the class furniture, set around their tables in groups, laid their mobile devices with headphones and battery charger on the group table and ready to start".

#### **4.6 Research Question 4 Results: Students' Perception towards F2F vs. Virtual collaboration**

To address the fourth research question and test the related null hypothesis (H<sub>03</sub>):

There is no significant difference between students' mean scores on perspective survey towards F2F collaboration compared to virtual collaboration, the difference of students' mean scores between the first two parts of the prospective survey was examined with a paired-sample t-test. Each part involved seven items. Table (20) provides the results of difference in students' mean scores between students' perception towards collaborative learning in the classroom compared to virtual collaboration.

As shown in Table (20), the mean of the students' test scores on the collaborative learning in the classroom (M=30.57, SD= 1.85) was not significantly different from the average of the students' test scores (M=29.11, SD=1.88) on virtual collaboration (p-value (0.62) > 0.05). Therefore, the third null hypothesis (H<sub>03</sub>) was accepted.

Table 20: Results of the Paired-sample t-Test: Experimental Group regarding collaborative learning in classroom and virtual collaboration

N=26	Test	Max.	Min.	M	SD	<i>p</i>
Experimental group	Collaborative learning in the classroom	33	26	30,57	1.85	.62
	Virtual collaboration	34	26	29,11	1.88	

#### 4.7 Research Question 5 Results: Managing the collaboration in groups

The data collected from the interview (the second question), acknowledged this research question. Students clarified that they did it in different ways; three groups out of seven tended to divide the task into subtasks and collaborate to accomplish them using some suggested mobile apps; such as Hangout app for video and audio calls, Edmodo for sending comments and feedback on each group work as Figure (11) shows how the experimental group divided into seventh collaborative groups. Furthermore, some groups chose to use WhatsApp for text messaging and sharing Audio or pictures related to their assignments. While the other four groups did not have a clear plan of dividing the task, but they did rely on a member to lead the group. The leader received all the data gathered

from other members, asked for more support when it needed and shaped the final product.



Figure 11: The collaborative groups on Edmodo

#### **4.8 Research Question 6 Results: Advantages and limitations of BYOD program supported with collaborative group work strategy**

The qualitative data collected from students' interviews besides the researcher field notes were used to address research questions number six.

Concerning the privileges of BYOD program, the learners pointed out answering the first and third interview questions that the program offered them the opportunity to collaborate with their group mates, to plan their task, organize their learning, learn from each other, and interact efficiently which helped them to improve their social skills. They stated that they accomplish different types of tasks and assignments and learned diverse ways of presenting their work to the teacher and other groups. Moreover, they were responsible for their learning, offered them new techniques to learn English, improved their digital skills and made learning interesting and more appealing to them. Students put collaboration with groupmates in the first place, then employing their mobile devices in learning and creating videos and sharing them followed by providing and receiving feedback and evaluating another groups' work. coding plan, "BYOD program's specialties compared to traditional learning" category in addition to the third category "The best of the program" summarized the answer. (See Appendix O).

The researcher remarked in her field note that students were opened to ask others for help coping technical issue and interestingly some students could assess their classmates

solving technical problems in no time. Further, the students have been motivated by the competition among groups and sharing their videos on the classroom YouTube channel. See Figure (12)

On the other hand, the fourth interview question tackled challenges and problems faced students during the experiment. The fourth category from the coding plan “Difficulties” summarize the answer. Most of the reported difficulties were technical in nature; two groups mentioned difficulties in uploading their videos online; another group complained about slow wi-fi connection. The other groups added downloading apps, dividing the task into subtasks and managing virtual collaboration. While the researcher underlined in her field notes the following challenges and limitations during the program;

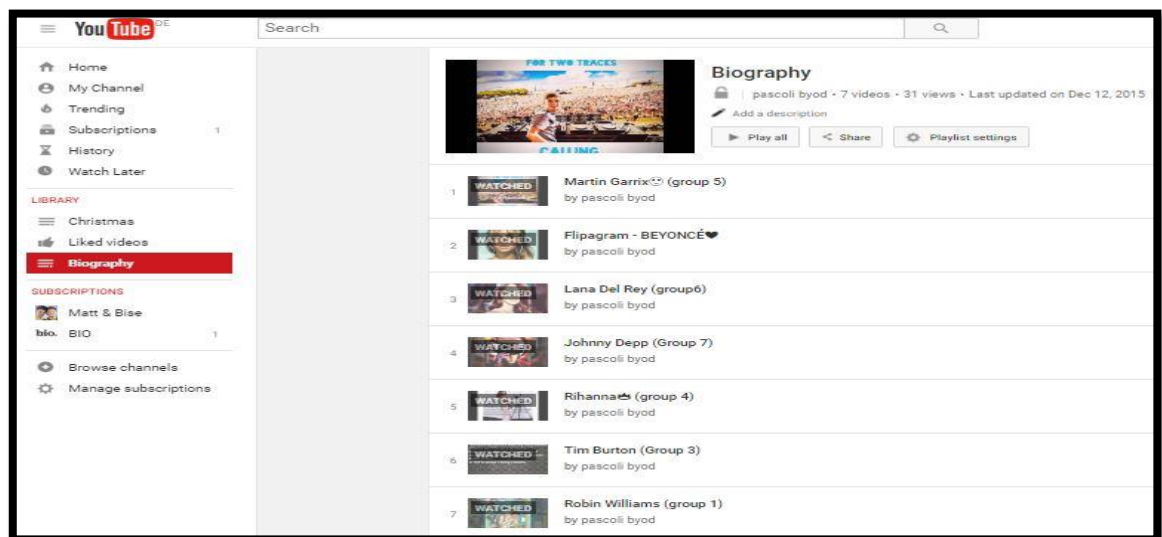


Figure 12: The groups videos shared on the classroom YouTube channel

- The teacher became overwhelmed with her new role as a moderator during the program in a way that could affect the learning process. She stated that “it is a time-consuming mission to stay in touch with students after the school day”. She asked for help, thus the researcher assisted her and tackled the class learning platform (Edmodo), where she checked students posts and their weakly assignments. She provided them with feedback, track their progress online and sent them reminders when it is needed.
- Classroom management was another challenge for the teacher, since the new

collaborative and digital environment in class demand different style of management than in the traditional classroom.

- Another worth noting case was; two male students who were shy and conserved to record their voices while they participated in a group task, since it would be shared with other groups. One of them involved his voice in completing the task, but rejected to share it with other groups, while the other choose another format to participate in the group work without recording his voice.

## CHAPTER 5

### SUMMARY, DISCUSSION AND RECOMMENDATIONS

#### 5.1 Overview of the study

This study provides empirical data to verify the effectiveness of employing the proposed BYOD program on improving students' achievement in EFL and their collaborative skills, besides surveying learners' perceptions toward the program. The study was conducted in the winter of 2015 in a public Secondary school in Florence. Participants, ages fourteen to sixteen, were assigned to two groups. The control group was taught the six sessions EFL using traditional methods and standard student textbook. The experimental group was taught the mobilized version of the textbook with collaborative learning strategies. The study was developed utilizing mixed methods to gather data, including a series of pre-and post-tests, semi-structured group interviews and a survey with 30 statements to express participants' perspective towards the proposed activity exploiting BYOD approach and collaborative learning strategies. Significant differences were found using t-tests for independent samples. The results of this study provided insight into educators' consecutive trials to integrate the updated technology in the curriculum.

This chapter presents interpretations to the results reported in Chapter 4 and create relations between the research questions and the reviewed literature.

An analysis of the data collected during the study was used to address the following research questions:

**Q1.** To what extent is there a difference in EFL achievement between students who learn according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods?

**Q2.** To what extent is there a difference in group work competencies between students who learn according to BYOD approach supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods?

**Q3.** What are students' perspectives of BYOD program with the collaborative group work strategy?

**Q4.** Is there a difference in students' perspective between F2F and virtual collaboration strategies?

**Q5.** How do students in the experimental group manage the group work?

**Q6.** What do students consider to be the main advantages and limitations of BYOD program supported with collaborative group work strategy?

The study was guided by the following hypotheses;

H<sub>0</sub> 1: There is no significant difference between the mean FFL test scores of students learning according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods.

H<sub>0</sub> 2: There is no significant difference between the mean TWC test scores of students learning according to BYOD program supported by collaborative group work strategy compared to students learning according to the traditional textbook and methods.

H<sub>0</sub> 3: There is no significant difference between students' mean scores on perspective survey towards F2F collaboration compared to and virtual collaboration.

## **5.2 The Awareness of Mobile Technology**

Outcomes from the pre-survey showed that two-third of the participants (68%) owned a mobile phone and preferred to bring them to school for learning the purpose, while almost one-third stated that they preferred a touchscreen tablet (20% iPad, 10% Android tablet). This data is compatible with previous studies (Saleh & Bhat, 2015; Song, 2014; Crompton & Burke, 2015) where the majority of students utilizing mobile phones over another type of devices. When it comes to mobilizing learning activities, it is crucial to explore the type of students' mobile devices, because it affects the designing choices such as the suggested applications to do the activity and the associated learning strategy (F2F or virtual collaboration). In this study, the learners used to bring their mobile phones to use them on the way to school or back home. Thus, it is more convenient to use them for learning purposes.

Additionally, the results from the awareness of mobile technology indicated that about two third of participated students (64%) have never utilized their devices to complete learning tasks, which means students are not familiar with integrating technology in the

classroom. Therefore, the researcher considered this point and prepared two introductory sessions in which the researcher cooperated with the Informatics teacher to provide students with the basic information needed to understand the nature of BYOD program activities and introduce them to the proposed applications. See Appendix H, K.

In relation to students' awareness of Cloud features, the results exposed that most of the participants were not familiar with harnessing Cloud for learning purposes and above of half percentage did not know how to save or share files on Google drive. This result induced the research to boost students' awareness of Cloud-based learning in the introductory sessions before starting the main sessions.

The results from pre-survey (sixth and seventh questions) reflected students' knowledge and usage of the proposed mobile applications employed in the program. As Figure (10) shows, students' awareness about the applications were varied; YouTube and video maker apps were the most conversant apps with (88%, 52%) consecutively. Though, the percentage of students stated that they have never used these two apps for learning were high (96%, 92%). Mind Map, Padlet, and Voice recorder were the most unfamiliar apps with (94%, 92%, 88%) respectively. Interestingly, more than 80% of participants stated that they have never used any of the proposed apps for learning before, which makes the program a novel one and prompts the researcher to start the program with two introductory sessions.

### **5.3 Research Question 1 Findings: Academic Achievement**

At the start of the study, t-test for pretest showed that there is no statistically significant difference in EFL test mean scores between the experimental group and the control group before starting BYOD program. ( $p$ -value= 0.567). Therefore, there was no evidence to suggest that the groups were different in terms of their English skills. However, at the end of the study, both groups (experimental and control groups) have reached significant improvement in the post-test. Though, the Coefficient of determination ( $r^2$ ) for calculating the effect size from a pre-post test of the experimental group ( $r^2 = 0.793$ ) is bigger than the size effect of scores from a pre-post test of the control group ( $r^2 = 0.6$ ) and considered as a large size effect. Moreover, the difference in mean of the posttest scores of the control group was significantly different from the mean of the post-test scores of the experimental group with ( $p$ -value=.042) and a medium size effect ( $r^2 = 0.103$ ).

These positive results regarding the improvement in student academic achievement after employing mobile learning program are similar to findings from former studies (Looi & Wong, 2014; Maher & Twining, 2016; Mouza & Barrett-Greenly, 2015).

The researcher would attribute this results to BYOD program activities which considered different English skills (Reading, Grammar, Listening, Writing and Speaking) and did not emphasize one over the other. The program offered variety in regard to assignments/activities as well as the utilized applications. Another explanation could be improving students' commitment to do their homework which they did in groups utilizing synchronous communication, besides students in the treatment group were taking advantage of getting immediate feedback from the teacher and other members in the group utilizing the program learning platform (Edmodo). Additionally, they had the opportunity to learn from other members of their group as well as from others group work since they had access to all submitted work on the class platform.

Additionally, at the end of each learning activity, students were required to create their own learning product, using their own resources supported with an Internet connection and suitable applications on their mobile devices. Such environment would encourage learners to consider their interests and participate in a personalized and relevant learning experience.

#### **5.4 Research Question 2 Findings: Teamwork Competencies**

The results from t-test examining the mean score differences between the experimental and control groups indicated that there was no significant difference between the two groups regarding their average level of teamwork competencies before they start the program (p-value = 0.645). However, at the end of the program, the control group t-test showed no significant improvement in teamwork competencies (p-value = 0.577) neither the mean of the pretest scores compared to the mean of the post-test scores. On the contrast, mean of the pretest scores for the experimental group was significantly different from the mean of the post-test scores. Also, the pre-post t-test revealed a significant improvement in teamwork competencies, with a large size effect ( $r^2 = 0.613$ ). Comparing the results from the post-test between the two groups, the mean of the experimental group was higher compared to the mean of the control group. Further, t-test for the post-test showed a significant difference in mean score between experiment and control groups (p-value =  $7.393e^{-}$ ) with a large size effect ( $r^2 = 0.495$ ). Nevertheless, the differences in the

post-test means between the two groups were not all significant when it comes to each category of TWC scale (Conflict resolution, Collaborative Problem Solving, Communication, Goal setting and Performance Management, Planning and Task Coordination). The results exposed no significant differences in means between the experimental and control groups for two categories; Communication and Planning and Task Coordination. Overall, the experimental group acquired a significant improvement in collaborative competencies with a large size effect.

These overall positive findings concerning the development of students' collaborative competencies at the end of BYOD program come consistent with the findings from a study conducted by Parsons & Adhikari (2016)

These results would be ascribed to the adopted F2F and virtual collaborative learning strategy during BYOD program. Working in small groups brings a lot of opportunities to boost students' collaborative competencies, in which students can set goals, exchange ideas, propose suggestions to solve problems, communicate and share their thinking. Another justification stand behind this result could be the task-based approach which considered a student-centered that offers students a voice and a choice in their learning and afforded them a wide space for discussion, planning and making decisions.

### **5.5 Research Question 3 Findings: Students' Perspective towards BYOD program**

As shown in Table (19), results from students' perspective survey covered students' views about four aspects of the program;

(a) Collaborative group work in class; The highest mean score was for expressing satisfaction about F2F collaboration strategy (mean= 4.73, SD= 0.45), then sharing ideas and effective discussion throughout communication (mean= 4.46, SD= 0.58).

(b) Virtual collaborative group work; The highest mean score was for stating enjoyment of virtual collaboration strategy (mean= 4.26, SD= 0.66), next was the motivation to work with other groupmate online, exchanging ideas virtually. (mean= 4.19, SD= 0.40)

(c) Learning with a wireless connected mobile device; The students demonstrated their appreciation to mobile device integration in their learning (mean= 4.30, SD= 0.47), and marked tracking their learning progress as the highest benefit from using wi-fi ready device (mean= 4.15, SD= 0.54), besides improving their digital skills (mean= 4.11, SD=

0.86).

(d) Learning with mobile apps; The highest mean score in this dimension was for students indicating that the proposed applications helped them create their own learning materials and be more active and productive (mean= 4.46, SD= 0.50). while the next beneficial of mobile applications from students' view was facilitate and organise learning (mean= 4.19, SD= 0.40).

Developing a positive perception of the proposed BYOD programming by the participants was verified in prior studies ((Hwang, Huang, Shadiey, Wu, & Chen, 2014; Song, 2016). For current study, collaborative learning strategy could be a principal key that emphasizes interactive communication. Students affirmed their motivation to work in groups. This finding even supported by data from the interviews when one participated group underlined: "what was special about this learning experience is the opportunity to work with other classmates in a small group, exchange ideas and negotiating to complete our task. Now we know more about each other and we became closer friends". Another factor might lead to the positive perspective is getting students' hands in their learning and let them produce their own learning products which reflect their interests and need by integrating digital tools. These results suggest indication of the pedagogy ahead of technology (Pegrum, Oakley, & Faulkner, 2013, p.76)

#### **5.6 Research Question 4 Findings: Students' Perception towards F2F vs. Virtual collaboration**

A t-test comparison was conducted for students' perceptions of F2F and virtual collaboration. The outcomes affirmed no significant difference in students' view towards both collaborative strategies. Students were expected to be inclined to F2F collaboration (Parsons & Adhikari, 2016) , since they might practice it formerly and it is not demanding as the virtual collaboration, though it seems that they were excited about virtual collaboration too. Especially when the constancy of collaboration and communication after the school day is concerned.

Video or voice calling through Hangout or Skype, real time feedback from the teacher or the groupmates through Edmodo platform, are unique potentials that make virtual learning appealing for students as F2F learning.

### **5.7 Research Question 5 Findings: Managing collaboration in groups**

Findings revealed that students working in groups had different ways to deal with their task-based learning activities. However, they all approved using their devices to search the Internet, communicate with each other, share files, receive and provide feedback. In that way, students were improving their overall digital skills beside teamwork competences and those are the skills students need to become globally competitive in the 21st century. These results are similar to findings from former studies (Ng & Nicholas, 2013; Parsons & Adhikari, 2016).

### **5.8 Research Question 6 Findings: Advantages and limitations of BYOD program supported with collaborative group work strategy**

The results stressed several advantages and difficulties noted by students through the interviews, and the researcher through the field notes. Concerning the advantages, three groups out of seven presented themselves in the interview as a tech or digital generation and BYOD program has matched their needs and interests which boost their engagement. The triangulation of data collected from students' perspective survey, interviews and the researcher field notes consistently indicated that the participants in this study place collaborating with workmates as the greatest privilege of the program, followed by utilizing their devices for learning which provide an evidence that "pedagogy is overcoming the technology" which is similar to results from a previous study conducted by (Pegrum, Oakley, & Faulkner, 2013, p.76)

In relation to the challenges, students reported few technical difficulties related to downloading mobile applications and slow wi-fi connection. That is because of the variation of students' devices and the limited memory capacity and unsustainable signal strength, since the school wireless network did not cover the whole school campus, and the lack of bandwidth.

While the field notes highlighted difficulties faced the teacher during the program, namely handling virtual collaboration and class management.

BYOD programing accompanies with a shift in the traditional roles of the teacher, thus teacher educational practices in pre-service and in-service require to keep up with mobile digital technologies and provides them with the specific knowledge about how to exploit mobile technology in their subject areas.

The collaborative and digital environment in class demand different style of management to assure that learning is running smoothly, and all groups are on board. Time management and well-prepared tasks are the milestones when it comes to the class management in this initiate, which combines integrating students' mobile technology with teamwork. The session time should be well organized to cover the three phases of task (pre-task, during the task and post-task). Thus, it is important to estimate each task duration throughout planning for the session which could fit to one complicated task or two simple tasks. Regarding task preparation, clarifying the task, the proposed apps to accomplish it and dividing it to subtasks are essential to avoid students' confusion.

Therefore, the researcher supported the teacher and provided some tips to facilitate classroom management, such as utilizing the "stop light" method; Green light means that it is time for students to start the task and use their technology however they choose, yellow light means that the time is about to run out and students should hurry to complete the task on the time, while red light means that time is over and mobile devices should be put away. Another tip is using consistent "key phrases" to control devices during the session (i.e. "Hands up", "hands in the air", "devices off", device face down").

The field notes reported an interesting case, in which two students were shy or conserved to include their voices or pictures. To deal with such cases, the researcher recommends enhancing instructive feedback and assuring students' safety from bullying. One way to do that is to activate privacy features on Edmodo, in which students' comments and posts should be accepted by the teacher before getting published. In any manner, students should be comfortable in their learning, and BYOD program activities were designed to be flexible and offered multiple scenarios option for students to create and share their learning. Thus, learners were free to choose the one which fits their needs and desires. For instance, a student can choose to send a written message instead of voice message, or insert the information in the video written as a subtitle instead of combining his voice, etc.

## **5.9 Implications of the Results for Practice**

The implications have been derived from the findings and the literature review; The adoption of BYOD approach in daily school activities, do arise technological infrastructure demands, bandwidth, hardware and software, and technical support (Scott, 2012). Obviously, running BYOD program requires a good wireless connection

throughout a school campus, Internet filters that fulfill with the district's acceptable use policies, facilities to charge devices in school, etc. The implications are dedicated to the school and the teacher;

For the school, it seems essential to have a fulltime technology facilitator who supports teachers not only in coping with the technical issues but also in promoting their abilities as designers of mobile-based activities in the classroom. He may provide them with inspiring lessons plan of integrating mobile devices into the learning process and share best practices with other teachers. Moreover, teachers and the technology facilitator should participate in ongoing professional development to stay updated with rapid technology innovation, that could be exploited in education. However, in a small-scale study, like the current one, the cooperation between the researcher, classroom teacher and the Informatic teacher in the school was enough to launch a mobile learning program, since the researcher played the role of the tech-savvy during the experiment.

Another milestone is the school digital media policy. The school district needs to approach acceptable use policies for the emerged technology, which keep students safe from the harmful content and provide them with efficient access to digital resources (Bosco, 2013). Students and their parents should be clearly informed and engaged in an agreement to organize this issue.

For teachers involved in a new technology initiative is to familiarize themselves with different mobile pedagogies framework, practice designing mobile-based activities and participating in ongoing professional development.

Also, it is vital to start the mobile program with a pilot study and introductory sessions, in which students get instructions about the nature of the program, the expected benefits and tips to deal with technical issues related to selecting the productive applications to be used, and the functionality of the chosen learning management system for saving and sharing files. Such a step makes the students more comfortable and less confused since they already had clear guidelines. Technology might let the teacher down. Thus, alternative lesson plans should always be considered in case that something goes wrong (e.g., unexpected crash on the platform or a cut in the internet connection).

### **5.10 Recommendations for Future Research**

The researcher recommends conducting this study again employing BYOD approach and

collaborative learning strategy with a larger group of participants, different classes from K-12, and different courses. An additional study may also compare between different BYOD models regarding the ownership (students vs. school mobile devices). Or between BYOD sharing device model and 1:1 BYOD model.

The researcher mobilized two units from students' English course book to be covered during BYOD program (9 sessions; 3 sessions for the pilot study and 6 sessions for implementing BYOD program). So further research is recommended with a larger scale study using a complete mobilized curriculum. Ministry of education should consider researchers effort and their studies' findings in reframing the adopted curriculum in a way that offers teachers choices and possibilities to integrate mobile devices in achieving the expected goals.

Another interesting study would be repeating the experiment comparing between learning with BYOD program using collaborative learning strategies in one group and individual learning strategies in the other. Combining teachers and parents' perspective about BYOD program is an additional area to be enriched with more investigation.

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## APPENDICES

### Appendix A.

#### Mapping Empirical Research on BYOD k-12 education

Author(s) and year	Research purpose	M. device type	Model of ownership, Learning strategy	Context	Research design, method & tools	Findings
(Ahmed & Parsons, 2013)	To investigate the effectiveness of using 'ThinknLearn' app to facilitate student learning.	Not specific.	Students 'ownership.  Individual learning using a mobile app that supports Science.	Secondary school	Mixed strategy based on questionnaires and semi-structured group discussions.	The mobile learning environment can help learners to enhance their learning performance
(Avraamidou, 2013)	To examine students' perception towards a project-based science intervention	Handhelds that had Windows Mobile.	Students 'ownership.  Collaborative learning through classroom discussions and various preparatory instructional activities in Science.	Primary school  5 <sup>th</sup> grade	A qualitative study based on classroom observation, interviews, and analyzing students' work.	All students were engaged in the activities with great interest and enthusiasm, and they enjoyed the collaboration with the scientist as well as the context of the intervention
(Boticki, Wong, & Looi, 2013)	To describe the design of a technology platform for supporting content-independent collaborative mobile learning in the classroom	Smartphone.	Students' ownership  Collaborative learning through a platform that supports learning mathematics and Chinese language.	Primary school	A mixed approach that utilized Design-based (with focus group observation and interviews).	The intervention software design seems to be effective in supporting better pedagogical and learning strategies for students and enhanced their collaboration and learning.
(Ciampa, 2014)	To explore using tablets as part of classroom instruction, teacher and students' view towards the experience.	iPad, iPod & iPhone (at home), tablet (at school).	Students' ownership (used only at home), on-campus (used at school)  Individual learning using some mobile apps and games that support Language Art (reading).	Primary school  6 <sup>th</sup> grade	A qualitative case study based on semi-structured individual interviews, Blog, and observational field work	Students' motivation can be enhanced through the challenge, curiosity, control, recognition, competition, and cooperation.

Appendix A. continued

Author(s) and year	Research purpose	M. device type	Model of ownership, Learning strategy	Context	Research design, method & tools	Findings
(Conway & Amberson, 2011)	To identifying how laptop computers could best be used to support second-level students with literacy difficulties	Laptops	Mixed ownership  Individual OR collaborative learning depending on the model of integration to support reading difficulties.	Secondary school  Grades (7-9)	Mixed strategy based on Questionnaire, classroom observations and thematic analysis of interviews	The results showed the increasing appeal of m-learning to support literacy and how schools mediate access to laptops and associated literacy learning.
(Chang, Wu, & Hsu, 2013)	To investigate the effects of different display modes of video captions on mobile devices on the English comprehension and vocabulary acquisition	PDA's, smartphones & e-books	School's devices.  Individual learning through proposed activities for listening and vocabulary acquisition.	Primary school  5 <sup>th</sup> grade	A mixed strategy based on the visual/verbal learning style measure, learning.  Achievement tests, and the questionnaire for measuring the students' technology acceptance.	The learning outcomes of the English target-word group was as good as that of the full-caption group  Target-Word group and the full-caption group showed better results than the non-caption group in vocabulary acquisition.
(DeWitt, Alias, & Siraj, 2014)	To investigate whether a collaborative MLearning (CML) prototype designed for collaborative problem-solving can be used for learning Science	laptop+ mobile phone.	Students' ownership  Collaborative learning using Wikis, discussion forums and text messaging quiz through a web page to learn Science.	Secondary school	Qualitative study based on interviews and analyzing students' online communications,	The CML prototype seems to enhance students' communication using the language of science which has been incorporated in the knowledge-building process.
(Ekanayake & Wishart, 2013)	To investigate how mobile phones could be used to facilitate teaching and learning science.	Mobil phone.	Support from a Local telecommunications provider by a loan of 20 mobile phones  Collaborative learning using mobile phone	Primary & secondary school  6 <sup>th</sup> , 10 <sup>th</sup> and 11 <sup>th</sup> grades	A qualitative study based on classroom observation, interviews and analyzing teachers' planning.	Using images and video captured on mobile phones supports teachers in bridging outside world with the classroom, distributing

Appendix A. continued

Author(s) and year	Research purpose	M. device type	Model of ownership, Learning strategy	Context	Research design, method & tools	Findings
			functions emerged in learning activities in school garden; taking pictures, voice recording, share by Bluetooth			instructions, evaluating students' learning and revising students' misconceptions
(C. K. Hsu, Hwang, & Chang, 2013)	To examine the effectiveness of the personalized reading material and mobile-assisted translation annotation in improving the learning achievement of the students	Not specific	School's devices  One experimental group learned individually with individual annotation mode and another experimental group learned with shared annotation mode.	Secondary school	A quasi-experimental study with two experimental groups and one control group, a pre- and post-test was implemented besides the Technology Acceptance Model (TAM).	Students in both experimental groups show better learning achievements and outstanding learning attitude toward using the personalized mobile language learning system than those in the control group.
(Hung, 2016)	To enhance the face-to-face instruction in flipped classrooms with the use of clicker app through (BYOD) model to gamify ESL classroom dynamics.	Smartphones, Tablets, and iPads.	Students' ownership  Individual learning is utilizing clicker app for polling answers during competitions.	Secondary school	A mixed strategy based on a survey, summative assessment and individual interviews.	The gamified use of clickers had positive influences on student learning, regarding their performance, perceptions, and preferences.
(Hwang et al., 2014)	To design learning activities supported by a mobile technology for improving learners' listening and speaking skills in English as a foreign language and exam students' perception towards these activities	PDA's	School's devices.  Collaborative learning with limited opportunity for individual learning with various designed activities supported by a mobile English listening and speaking system.	Primary school  5 <sup>th</sup> grade	Mixed strategy based on pre- and post-test questionnaire interviews and observation.	The students have positive intentions toward learning activities; thus, students are motivated to practice English skills more when using a mobile learning system.
(Janssen & Phillipson, 2015)	To explore the extent of 1:1 Learning and BYOD model implementation in schools and	Handheld device except for mobile phones.	School's devices  Individual learning 1:1 learning program.	Secondary schools	Statistical approach based on thematic coding and	(78.7%) Of schools have 1:1 Learning program; 64.4% are implementing

Appendix A. continued

Author(s) and year	Research purpose	M. device type	Model of ownership, Learning strategy	Context	Research design, method & tools	Findings
	identifies the type of information provided via school websites.				statistical analysis	BYOD, and there was no remarkable difference between government and non-government schools in BYOD implementation. Moreover, the majority of schools' websites were limited or lacking information about 1:1 Learning programs
(Kanala et al., 2013)	To explore the use of the prototype of a mobile application for the enhancement of children's motivation for writing.	Not specified	School's devices.  Individual learning via a mobile app that supports writing skills	Primary school  5 <sup>th</sup> grade	A qualitative study based on a field trial by a questionnaire and expert evaluations of a prototype of a mobile application.	The use of a mobile application can have potential in supporting children's creative writing skills and their motivation to complete writing tasks.
(Lan, Sung, & Chang, 2013)	To report the adoption of a mobile supported cooperative reading system into regular English as a foreign language (EFL)	Asus Eee Pad.	School's devices.  Collaborative learning through small reading groups using materials emerged in MCER system.	Primary school  3 <sup>rd</sup> grade	Mixed approach (Action research) based on survey and pre-post -test	The adaptation and use of the MCER system are successful and that enhance the acquisition of reading abilities by young learners if used within EFL classes around the entire school.

Appendix A. continued

<b>Author(s) and year</b>	<b>Research purpose</b>	<b>M. device type</b>	<b>Model of ownership, Learning strategy</b>	<b>Context</b>	<b>Research design, method &amp; tools</b>	<b>Findings</b>
(Lee & Son, 2013)	To develop a system that supported smart learning interaction and evaluates learning using the advantage of BYOD devices.	Tablet & smartphone	Students' ownership.  Individual learning through a mobile learning system that supports interactive learning and providing feedback.	Secondary school	Mixed approach (Action research) based on field trial and observation	The developed system seems to help students and the teacher in tracking learning progress through real-time interaction and receiving feedback through smartphone and tablet PC apps.
(Liu, Navarrete, et al., 2014)	To investigate an m-learning initiative using the iPod in teaching and learning English	iPod	School's devices for on-campus use extended to home (24/7 to teachers and students)  Individual learning and limited offers of collaborative learning utilizing multimedia resources prepared to support English learning in classes as well as assigned homework.	Primary & secondary school  Grades (5 – 8)	A qualitative case study based on interviews with the teachers, classroom observations, and surveys with the students.	iPod touch provides differentiated instructional support, and extend learning time to home. Several challenges were identified such as significant time demand on the teachers, technical issues, the need for professional training and dedicated support staff.
(Looi & Wong, 2014)	To study the adoption and the adaptation of the curricular innovation supported by mobile technologies	Smartphone with 24x7 access.	School's devices for on-campus use extended to home (24/7 to teachers and students).  Individual and collaborative learning through a variety of learning activities.	Primary school  3 <sup>rd</sup> -5 <sup>th</sup> grades	A mixed approach utilizing Design-based research (interviews with the stakeholders and class observation).	Seamless learning model (SLM) can raise student achievement in the context of one class and one teacher.
(Maher & Twining, 2016)	To clarify how mobile device strategies were	iPad	School's devices	Primary	Qualitative case	The BYO iPad

Appendix A. continued

Author(s) and year	Research purpose	M. device type	Model of ownership, Learning strategy	Context	Research design, method & tools	Findings
	developed and implemented and how the devices were being used in the schools		-Collaborative learning fitted with Byo iPad for the first school and individual learning with 1:1 iPad for the second one.	school	study based on questionnaires, interviews and classroom observations.	The BYO iPad strategies enhance and amplify the pedagogical stance of the teachers and impact positively on students' learning outcomes.
(Mouza & Barrett-Greenly, 2015)	To develop a professional initiative to help urban teachers in the U.S. learning how to utilize iPads and educational apps to support teaching and learning.	iPad	School's devices Individual learning with 1:1 iPad	Secondary school 8 <sup>th</sup> grade	Qualitative case study based on observations, interviews	Teachers gain skills needed to run mobile devices and apply mobile apps for instructional purposes. In turn, implementation of mobile apps fostered student academic improvement.
(Nedungadi & Raman, 2012)	To build a web-based adaptive learning and assessment system (ALAS) and investigate students' performance and perceptions while they use personal computers and mobile devices.	Smartphones.	External private funding (25 smartphones) Individual learning through (ALAS) including multiple tracks, each covering a different skill area.	Primary school 8 <sup>th</sup> grade	Experimental design based on pre- and post-test, and survey for students	Students can seamlessly switch between e-learning and m-learning systems without remarkable changes in the learning outcomes. Teachers could guide individual and group performances regardless the used learning environment

Appendix A. continued

Author(s) and year	Research purpose	M. device type, Reason	Model of ownership, Learning strategy	Context	Research design, method & tools	Findings
(Ng & Nicholas, 2013)	To dissect the findings of a longitudinal study of a secondary school adopting a personal digital assistant program and proposes a person-centered sustainable model for mobile learning	PDA's	School's devices.  Individual learning through different mobile apps.	Secondary school	Mixed strategy based on pre- and post-questionnaire, focus group interviews and class observation	Results show that the effective integration of ICT into teaching depends on a successful team leadership, cooperative community, and technical support.
(Parsons & Adhikari, 2016)	To report the challenges faced by teachers, students and parents in moving to a BYOD classroom, and the potential advantages for teaching and learning.	iPad	Students' ownership  Individual learning	Secondary school	A qualitative study based on thematic analyses for surveys that designed for students, teachers, and parents.	BYOD strategies have positive impacts such as developing students and teachers' digital skills, fostering individual and collaborative communications, However, engaging parents with their children's schoolwork was challenging.
(Pegrum et al., 2013)	To report the adoption of mobile handheld technologies in Western Australian independent schools	iPad, iPod & iPhone	Students' ownership.  Collaborative learning using mobile apps.	Primary school  6 <sup>th</sup> grade	Qualitative study based on interviews with staff	Mobile devices tend to boost student motivation and outcomes in the two small-scale studies. Reported difficulties involved ethical and the lack of teacher professional. the schools motivated to extend the use of handheld technologies in future

Appendix A. continued

<b>Author(s) and year</b>	<b>Research purpose</b>	<b>M. device type, Reason</b>	<b>Model of ownership, Learning strategy</b>	<b>Context</b>	<b>Research design, method &amp; tools</b>	<b>Findings</b>
(Song, 2014a)	To investigate the advancement of content knowledge students made in their science inquiry in a seamless learning environment supported by their mobile device and their perception regarding their learning experience	iPad, Tablet & Smartphone.	Mixed ownership (smartphone students 'smartphones and school's iPad.  Individual learning using educational apps that support science inquiry.	Primary school	Mixed strategy based on pre- and post-domain tests, self-reported questionnaire, class observation and analyzing students' artifacts	Students seem to advance their understanding of the proposed content and adopt positive views toward seamless science inquiry supported by their own mobile devices
(Song, 2016)	To explore how students developed their inquiry skills in science learning in BYOD-supported learning environments	Mixed types of handheld devices.	Students' ownership  Individual learning using educational apps	Primary school  6 <sup>th</sup> grade	Mixed approach	Students tend to advance their inquiry skill and develop a positive attitude toward the learning experience
(M. Zhang, Trussell, Gallegos, & Asam, 2015)	To investigate the effect of employing three math apps on students' learning of decimals and multiplication	iPad.	School's devices.  Individual learning through three Math apps	Primary school  4th grade	Quasi-experimental design based on Pre- and Post-test, and analysis of processes	The math apps appear to reinforce student learning in mathematics and support struggling students.

Appendix B. EFL test

1) **Reading:**

*Why are the British so bad at learning languages?*

The British are bad at speaking foreign languages. It's a fact. In any city around Europe, you can find British tourists asking for the restaurant menu in English. So why is this? I think laziness is possibly the key factor. There is a general feeling among British people that's everyone speaks English nowadays, so it's not worth learning other languages. Also, British people who live abroad can always find other British people to talk to, to go to British pubs with- all reason for never bothering to learn the local language. Moreover, less pupils study a foreign language at school, and they don't have as many hours of classes as pupils in other European countries. I think it is also a problem that British pupils don't study English grammar anymore, which makes it more difficult for them to learn the grammar of another language.

**Read the article above and tick the reasons why, according to the writer, the British are bad at languages.**

- a.  British people rarely travel abroad.
- b.  English is an international language.
- British people who lived abroad often don't socialize with the local people.
- d.  Language teachers in British schools aren't very good.
- e.  British people don't want to waste money learning languages.
- f.  Many British pupils don't study a foreign language at school.
- g.  British pupils don't know enough about their own grammar.

2) **Grammar:**

**Choose the right answer:**

- A. If I miss the bus, I..... a taxi.  
a. will get      b. got      c. would get
- B. I would enjoy the weekend more if I ..... to work on Saturday.  
a. don't have      b. didn't have      c. didn't had
- C. Whose coat is it? It is.....  
a. My      b. mine      c. you
- D. This is Mrs. Jackson's phone. It is.....  
a. Hers      b. her      c. theirs
- E. The girl is crying.....  
a. Angry      b. anger      c. angrily
- F. They are good dancers. They dance.....  
a. Good      b. well      c. better

**3) Listening:** (the audio should be played twice)

Listen to four people talking about their fears. Answer questions for each person.

The question	1	2	3	4
What is he/she afraid of?				
Why?				

**4) Writing:**

Write a biography (the life story) of a person you are interested in (150 words Max.), including;

- a. The basic facts of the person's life.
- b. What makes this person special or interesting?
- c. What is his/her major achievement?
- d. Do you think he/she live a happy life?

Appendix C. Team Work Competencies (TWC) scale. English version

**Dear students,**

The purpose of this test is to assess workgroup competencies. The test contains 30 elements and uses a 4-point scale of response frequency (always, almost always, almost never, ever). There is NO RIGHT OR WRONG RESPONSE. Please choose the most appropriate answer. Thank you.

The competence	Always	Almost always	Almost never	Never
1. When my group is in conflict, I try to make it explicit to find solution pathways.				
2. When I interact with my group mates, I ask questions to better understand what they say				
3. When I disagree with others, I make an effort to focus on what we have in common instead of centering on what separates us.				
4. I plan my tasks effectively.				
5. I try to use the most appropriate communication with my group to deal with the different types of information, avoiding the same formal procedure for all the time.				
6. I often get involved in monitoring the task performance of other team members.				
7. I look at people when they talk to me, and I modify my body language to show real interest in what they tell me.				
8. I can easily recognize people's emotional states by observing their nonverbal messages				
9. If someone in my group acts inappropriately, I talk privately with her/him, encouraging the rest of the team to do the same.				
10. To address the trivial task-related issues, I do not need to talk first with all team members to reach a decision.				
11. I try to know about my group mate's skills and our task requirements to assign it properly.				
12. I participate in discussions with group mates to make decisions.				
13. When my personal interests are in conflict with others' interests, I tend to be honest in the negotiation so that others understand my needs.				
14. I act to make group conflicts explicit in a way that they can be solved.				
15. I ask questions and express my opinions in a sincere and open way.				
16. I help my group mates to understand their roles during the tasks.				
17. When I am upset about something, I express my discomfort to the group in a constructive way.				

Appendix C. continued

The competence	Always	Almost always	Almost never	Never
18. I provide my group mates with feedback on their work.				
19. If something upsets me in my team, I do not like to act as if nothing has happened.				
20. I try to monitor our assigned tasks.				
21. When I am involved in the group task, I care about having clear plan to accomplish it on time.				
22. I encourage all members of my group to participate in the task.				
23. I prefer to do my group's task on my own because the contributions made by other members are not that important.				
24. We reach a majority agreement in the group to take any decision.				
25. I try listening to the opinions of my fellow group without evaluating them as good or bad.				
26. When we are working in groups, I present my opinion in an open and sincere way.				
27. I accept the others' feedback on my work.				
28. I try to share all the information related to the task with my group mates.				
29. I like to monitor the role assigned to each member of my group during the task.				
30. I take the responsibility to complete my part of the task, then others in the group can continue and do theirs.				

Appendix D. Team Work Competencies (TWC) scale. Italian version

**Cari studenti:**

Lo scopo di questo test è quello di valutare le competenze del gruppo di lavoro per gli studenti. Il test contiene 31 elementi e utilizza una scala di risposta con 4 punti di rilevazione (sempre, quasi sempre, quasi mai, mai).

*NON CI SONO RISPOSTE giuste o sbagliate. Siete pregati di scegliere la risposta più appropriata..*

*Grazie.*

le competenze	Sempre	Quasi sempre	Quasi mai	Mai
1. Quando il mio gruppo è in conflitto, cerco di rendere la cosa esplicita al fine di trovare vie soluzioni.				
2. Quando interagisco con i miei compagni di gruppo, faccio domande per capire meglio quello che dicono.				
3. Quando non sono d'accordo con i miei compagni di gruppo, mi sforzo di trovare ciò che abbiamo in comune, piuttosto che ciò che ci separa.				
4. Pianifico i miei compiti in modo efficiente.				
5. Cerco di usare una comunicazione appropriata con il mio gruppo per affrontare i diversi tipi di informazioni, evitando sempre una procedura formale.				
6. Mi viene spesso richiesto di monitorare le prestazioni dei miei compagni di gruppo durante le attività.				
7. Guardo in faccia le persone quando queste mi parlano e interagisco con una adeguata gestualità per far vedere che provo interesse a quello che dicono.				
8. Riesco a riconoscere facilmente gli stati d'animo delle persone, semplicemente facendo attenzione alle espressioni del loro viso o del loro corpo.				
9. Se qualcuno nel mio gruppo agisce in modo inappropriato, cerco di parlarci in privato e incoraggio gli altri componenti del gruppo a fare la stessa cosa.				
10. Per risolvere problemi di scarso rilievo, non ho bisogno di parlare con tutto il gruppo per prendere decisioni adeguate.				
11. Cerco di conoscere le capacità dei componenti del mio gruppo per poter assegnare i compiti in modo adeguato.				
12. Partecipo alle discussioni del gruppo per prendere decisioni.				
13. Quando i miei interessi personali sono in conflitto con gli interessi degli altri, tendo ad essere onesto/a in modo che gli altri capiscano le mie esigenze.				
14. Agisco per rendere espliciti i conflitti di gruppo in modo che essi possano essere risolti.				

## Appendix D. continued

<b>le competenze</b>	<b>Sempre</b>	<b>Quasi sempre</b>	<b>Quasi mai</b>	<b>Mai</b>
15. Pongo domande ed esprimo le mie opinioni in modo sincero e aperto.				
16. Aiuto i miei compagni di gruppo a capire i loro ruoli nel lavoro di gruppo.				
17. Quando sono arrabbiato/a per qualcosa, esprimo il mio disagio al gruppo in un modo costruttivo.				
18. Fornisco ai miei compagni di gruppo un feedback sul loro lavoro.				
19. Se qualcosa del mio gruppo mi infastidisce, non mi piace comportarmi come se nulla fosse accaduto.				
20. Cerco di monitorare i compiti assegnati.				
21. Quando il lavoro di gruppo è in corso, mi preoccupa di avere chiaro il piano di lavoro per realizzare l'attività richiesta in tempo.				
22. Incoraggio tutti i membri del mio gruppo a partecipare.				
23. Preferisco portare avanti il compito del mio gruppo da solo/a, perché i contributi degli altri non sono così importanti.				
24. Ogni decisione del gruppo è presa a maggioranza.				
25. Cerco di ascoltare le opinioni dei miei compagni di gruppo senza dare giudizi di valore.				
26. Quando stiamo lavorando in gruppi, presento la mia opinione in modo aperto e sincero.				
27. Accetto il feedback degli altri riguardo al mio lavoro.				
28. Con i miei compagni di gruppo cerco di condividere tutte le informazioni relative al compito da svolgere.				
29. Durante l'attività da svolgere mi piace monitorare il ruolo assegnato a ciascun membro del mio gruppo.				
30. Mi prendo la responsabilità di completare la parte del mio compito, poi gli altri in gruppo possono continuare e fare la loro.				

Appendix E. Students' perspective Survey of BYOD program (English version)

**Dear student,**

This questionnaire aims to explore your views on the program. Please specify your level of agreement with each of the following items. **NO RIGHT OR WRONG ANSWERS**, your opinion that counts!

The sentences	Strongly agree	Agree	Don't know so	Don't Agree	Strongly don't agree
<b>With face to face collaboration in class:</b>					
1. It is easy to collaborate with my teammates in order to complete our task.					
2. I collaborate effectively with my teammates to submit our work on time.					
3. I like to continue face to face collaboration in groups to learn the other subjects.					
4. I don't have a problem to communicate with my teacher.					
5. I don't have a problem with sharing my ideas with my groupmates.					
6. I am satisfied with my performance in my group during the tasks.					
7. I like the idea of face to face collaboration in teams.					
<b>With virtual collaboration in groups:</b>					
8. It is easy to collaborate with my teammates in order to complete our task.					
9. I am motivated to collaborate virtually with my teammates and submit our work on time.					
10. I like to continue virtual collaboration in groups to learn the other subjects.					
11. It is easy to communicate with my teacher virtually.					
12. I can share my ideas with my groupmates throughout the Internet.					

Appendix E. continued

The sentences	Strongly agree	Agree	Don't know so	Don't Agree	Strongly don't agree
13. I am satisfied with my performance in my group during the tasks.					
14. I like the idea of collaborative learning with my groupmates virtually through the Internet.					
<b>Learning with a wifi connected mobile device:</b>					
15. Makes me updated with my group mates and classmates progress.					
16. Improves my technical skills					
17. Helps me to learn effectively.					
18. I like to use my mobile device for learning the other subjects.					
19. I appreciate the opportunity to employ my mobile device in my learning,					
<b>Educational mobile applications:</b>					
20. Help me to organize my ideas.					
21. Help me to share and save my homework.					
22. Help me to receive feedback and constantly monitor my progress.					
23. Help me to communicate with my teacher.					
24. Help me to present my work in a different way.					
25. Help me to share my work with other groups in class.					
26. Help me to create my learning materials and be more productive.					
27. help me improve my conversation and listening skills.					
28. help me to learn from another groups' work.					
29. They are effective for real-time communication and collaboration.					
30. Help me to search for new information.					

Appendix F. Students' perspective of BYOD program Survey (Italian version)

**Cari studenti:**

Sto cercando di sondare il punto di vista degli studenti del progetto 'Apprendimento Collaborativo di gruppo tramite l'uso di dispositivi mobili come nuova strategia di apprendimento'. Esprimete il vostro punto di vista in ognuna delle affermazioni qui sotto riportate. Si prega di indicare il vostro livello di accordo con ciascuna delle seguenti voci . *NON CI SONO RISPOSTE giuste o sbagliate. E ' LA TUA OPINIONE che conta!*  
Si prega di scegliere la risposta più appropriata. Grazie.

<b>le affermazioni</b>	<b>Completamente d'accordo</b>	<b>D'accordo</b>	<b>Non so</b>	<b>Non concordo</b>	<b>Fortemente in disaccordo</b>
<b>Con gruppo di apprendimento collaborativo in classe:</b>					
1. E 'facile collaborare con i miei compagni di gruppo per completare il nostro compito.					
2. Collaboro efficacemente con i miei compagni di gruppo per terminare il nostro compito in tempo.					
3. Mi piacerebbe continuare questo tipo di collaborazione per imparare altre materie.					
4. Non ho problemi a comunicare con il mio insegnante.					
5. Non ho problemi condividere le mie idee con il mio gruppo.					
6. Sono soddisfatto della mia performance in gruppo, durante l'attività.					
7. Mi piace l'idea di lavorare in gruppo in classe					
<b>Con gruppo apprendimento collaborativo virtuale:</b>					
8. E 'facile collaborare con i miei compagni di gruppo per completare il nostro compito.					
9. Sono motivato/a a collaborare con i miei compagni di gruppo e inviare il nostro compito in tempo					

## Appendix F. continued

<b>le affermazioni</b>	<b>Completamente d'accordo</b>	<b>D'accordo</b>	<b>Non so</b>	<b>Non concordo</b>	<b>Fortemente in disaccordo</b>
10. Mi piacerebbe continuare questo tipo di collaborazione per imparare altre materie.					
11. E' facile comunicare con il mio insegnante/la mia insegnante.					
12. Posso condividere le mie idee con il mio gruppo via Internet.					
13. Sono soddisfatto/a della mia performance in gruppo, durante l'attività.					
14. Mi piace l'idea del lavoro di gruppo digitale/via Internet.					
<b>Imparare con un dispositivo mobile wireless:</b>					
15. Mi tiene informato/a e aggiornato/a con i progressi del gruppo.					
16. Migliora le mie capacità tecniche.					
17. Mi aiuta a imparare in modo più efficace.					
18. Vorrei continuare a utilizzare il dispositivo mobile nello studio di altre materie.					
19. Soprattutto accolgo con favore l'opportunità di utilizzare il mio dispositivo mobile in fase di apprendimento.					
<b>Applicazioni mobili didattiche:</b>					
20. Mi aiuta a organizzare e condividere le mie idee.					
21. Mi aiuta a condividere e salvare i miei compiti.					
22. Mi aiuta a ricevere feedback e monitorare costantemente i miei progressi.					

Appendix F. continued

<b>le affermazioni</b>	<b>Completamente d'accordo</b>	<b>D'accordo</b>	<b>Non so</b>	<b>Non concordo</b>	<b>Fortemente in disaccordo</b>
23. Mi aiuta a comunicare con il mio insegnante e con il mio gruppo.					
24. Mi aiuta a presentare il mio lavoro in modo diverso					
25. Mi aiuta a condividere il mio lavoro di gruppo con altri gruppi					
26. Mi aiuta a produrre materiali didattici speciali.					
27. Mi aiuta a migliorare la mia capacità di conversazione e di ascolto.					
28. Mi aiuta a imparare dal lavoro di altri gruppi.					
29. Sono efficaci per comunicazioni in tempo reale e per collaborare.					
30. Mi aiuta ad inviare file e messaggi ai miei compagni di gruppo.					
31. Mi aiuta nella ricerca di nuove informazioni.					

Appendix G. Interview questions

**a) Date:** 26 December 2015

**b) Time:** 10:00 a.m. till 11:00 a.m.

**c) Location:** The school

**d) The interviewer's name:** Zahia Alhallak (the researcher)

**e) The group number:** (from 1 to 7)

**f) Questions:**

1. *Can you describe how learning with BYOD program differs from the traditional learning in the classroom?*
2. *How did you manage to do your homework with your groupmates?*
3. *What do you like best about the program?*
4. *Tell me about difficulties that you faced during the program*
5. *What do you recommend in order to improve the program?*

## Appendix H. List of proposed mobile applications

**Note taking apps:** They are applications that used for saving and sharing your notes. Some of them allow you to create voice notes or photo notes besides text notes, such as Evernote, Catch Notes.

**Edmodo:** Edmodo is made to mimic Facebook's format, it is a secure social network. A visitor can sign up as either a teacher or a student, and connect immediately with anyone in the class, teachers and students can communicate, create activities and send assignments through the site itself. Students can create a profile with the group code to get started. Edmodo offers a very useful, and a modern way of handling homework.

**Padlet:** It is a web-based app means of collating ideas and collaborating online and share information among students. It looks like the blackboard where students can post photos, files (word, Pdf), URL or even voice.

**Videomaker/Editor:** It is an application for creating video from Images and Music with the possibility to share it with others. Students use the app for storytelling and presentation. Proposed apps are; Animoto, Magisto

**Mindmap app:** A mind map is a diagram that connects information around a central topic or subject. This app is useful for note taking, brainstorming, planning, writing, and summarizing. Proposed apps are; [Idea Sketch](#), [Mindomo](#).

**YouTube app:** to upload students and teacher videos and screencasts, comments on videos, and create playlists to organize videos and share it with all students.

**QR code app:** It is used to scan quickly and in real- time any QR code. The code may contain text, URL or picture. Students can print, download or even share the code. Also, they can create their codes. Proposed apps are; Kaywa Reader and Barcode Scanner.

**Voice recorder:** is an audio recorder to record high-quality sounds, such as Smart Voice Recorder.

**Google Drive** is a cloud storage service that allows students and teacher to store their documents, photos, videos, and more online. From Drive, they can also use Google Docs, Google Sheets, and other applications to create and edit various types of files.

**Hangout** is a video or voice chat service, to make conversation with one person or a group.

Appendix I. General plan for the learning sessions

Mapping the program

Session number	Types of tasks	Face to face collaborative task	Virtual collaborative task – Homework-	Apps
<b>8A</b>	<i>Reading and writing</i>	-Tell us your problem	Creating problems and giving advice	QR reader, Voice recording, Mindmap, Padlet, Note taking.
<b>8B</b>	Reading, Grammar; the first conditional	-Who is Murphy? -Examples combine Murphy's law with the first conditional	Creating more examples in specific fields.	Google Docs
<b>8C</b>	Grammar; Possessive Pronouns and Adverbs of Manner	-Possessive pronoun diagram	Quiz and exercises	Mind map, Edmodo blog, Google docs.
<b>9A</b>	Speaking & writing; Italian tradition festivals for the Christmas and the new year	-Create a presentation about Italian tradition festivals for the Christmas and the new year	Choose another important festival that you like and post a note about what do you do in it	Google docs, Padlet, video maker app or a presentation software
<b>9B</b>	Vocabulary related to phobias and fears. Listening and speaking	-What are people afraid of? Why? - What about you?	Presentation about some kinds of phobias	Audio player, Voice recording, Note taking app and Google drive

Appendix I. continued

Session number	Types of tasks	Face to face collaborative task	Virtual collaborative task – Homework-	Apps
<b>9C</b>	<i>Speaking and writing</i>	-Who's your favorite personality?	Writing a biography	Internet browser, taking notes app, voice recording app, and video maker app or a presentation software

Appendix J. All sessions' plans

UNIT 8	SESSION 1: <i>What should I do?</i>	
Age group: 15-16 years	Level: B1	Time: 45 minutes

<b><i>Aims</i></b>	Practice reading, writing and talking about problems and give a piece of device.
<b><i>Objectives</i></b>	<p>✓ Learn how to give a piece of advice and practice useful structures; Example; <b>A:</b> I have a problem, I am not sure what to do..., I don't know what to do..., what should I do?</p> <p><b>B:</b> I think you should, you shouldn't.....</p> <p>I don't think you should....</p> <p>✓ Practice reading ✓ Practice writing</p>
<b><i>Input</i></b>	<p>Materials; QR Codes created in advance to present the problems that students need to provide advice and suggest solutions to solve them.</p> <p>Worm up; A short discussion with the classroom groups;</p> <p>- If you have a problem that you need to talk about, do you talk to a friend or to a member of your family? Why?</p> <p>- Do you think man find it more difficult than women to talk about their problems? Why (not?)</p> <p>- In this lesson, you will learn about giving a piece of advice and suggesting solutions.</p>
<b><i>Condition</i></b>	<p>Proposed applications; Voice recording, QR code reader app, Note-taking app and Google Drive.</p> <p>Learning performance; collaborative learning in small groups. Collaboration settings; face to face collaboration and virtual collaboration.</p>
<b><i>Procedure</i></b>	<p>First, each group gets one of the QR code sheets from the teacher.</p> <p>Then, they use QR code reader to read the problem.</p>

	<p>Next, they start discussing it using Note-taking app to save their ideas.</p> <p>Then, they document all suggestions by creating a mind map or using voice recording to create an audio.</p> <p>Finally, each group should share their problem with the suggested solution by using google drive.</p> <p>The task is implemented online and offline during the class time.</p>
<b><i>Predicted outcome</i></b>	A mind map or audio to present the possible advice and suggested solution for the problem
<b><i>Final Product &amp; Evaluation</i></b>	The product is open, and there is no limit for the outcomes since it depends on students' creativity to think about suitable advice and solutions. Each group gets feedback from other groups and from the teacher during the assessment discussion.
<b><i>Homework task</i></b>	Each group should create a problem and choose a specific group to suggest solutions for it. The cooperation between the groups and the collaboration between the group mates will be organized throughout Edmodo platform and google drive to send and receive problems and solutions.

UNIT 8	SESSION 2: <i>Murphy's law</i>	
Age group: 15-16 years	Level: B1	Time: 45 minutes

<b><i>Aims</i></b>	Practice reading and first conditional
<b><i>Objectives</i></b>	<ul style="list-style-type: none"> <li>✓ Learn when to use the first conditional; possibilities in the present or in the future.</li> <li>✓ Learn how to formulate the structure of the first condition; If + present simple, ... will + infinitive</li> <li>✓ Practice comprehensive reading</li> </ul> <p>Materials; Digital pictures (presentation).</p> <p>Worm up; A short discussion with the classroom groups;</p>
<b><i>Input</i></b>	<p>- It happens that if you wear a new white shirt or dress, you will spill wine or coffee on it. Or if you are late for something important, all the traffic lights will be red. That is what Murphy's law declares; If there is a wrong way to do something, then you or someone else will do it.</p> <p>- In this lesson, you will learn about formulating and using the first conditional</p>
<b><i>Condition</i></b>	<p>Proposed applications; Voice recording, mind map, Edmodo platform and google drive.</p> <p>Learning performance; collaborative learning in small groups. Collaboration settings; face to face collaboration and virtual collaboration.</p>
<b><i>Procedure</i></b>	<p>First, the teacher presents several digital pictures.</p> <p>Then, she asks each group to create sentences that match Murphy's law and reflects each picture using the first conditional.</p> <p>Next, each group record their sentences creating an audio OR creating a mind map with the sentences</p> <p>Finally, groups share their products using google drive which is</p>

<p><b><i>Predicted outcome</i></b></p> <p><b><i>Final Product &amp; Evaluation</i></b></p> <p><b><i>Homework task</i></b></p>	<p>connected with Edmodo.</p> <p>The task is implemented online and offline during the class time.</p> <p>A mind map or audio to present the possible complementary sentences</p> <p>The product is open, and there is no limit for the outcomes since it depends on students' creativity to think about suitable complementary sentences. Each group gets feedback from other groups and from the teacher during the assessment discussion.</p> <p>Each group should create a set of sentences using the first conditional and reflect Murphy's law in one of the following categories; in love, in the shopping, in travel, in studying or at work, then they should share their work on Edmodo.</p> <ul style="list-style-type: none"> <li>- More exercises about the topic added by the teacher on the platform; e.g., listening to a song that contains several sentences with the first condition and complete the missing words.</li> </ul>
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Appendix J. continued

UNIT 8	SESION3: <i>Possessive pronouns &amp; adverbs of manner</i>	
Age group: 15-16 years	Level: B1	Time: 45 minutes

<b><i>Aims</i></b>	Practice the use of possessive pronoun & adverbs of manner
<b><i>Objectives</i></b>	<ul style="list-style-type: none"> <li>✓ Learn the function of possessive pronouns and their meaning.</li> <li>✓ Practice replacing complex structures with simple possessive pronouns.</li> <li>✓ Learn the function of adverbs of manner and where to place them in a sentence.</li> <li>✓ Practice comprehensive reading</li> </ul> <p>Materials; A clip and video.</p> <p><a href="https://www.youtube.com/watch?v=CWxrJI_Tna8">https://www.youtube.com/watch?v=CWxrJI_Tna8</a></p> <p><a href="https://www.youtube.com/watch?v=YEgGO6ZDQC0">https://www.youtube.com/watch?v=YEgGO6ZDQC0</a></p>
<b><i>Input</i></b>	<p>Worm up; The teacher motivates her students to learn about possessive pronouns by playing a clip and asking them to listen carefully for the first time, then the teacher replays the clip again but without the voice and let the students sing the song which contains all possessive pronouns.</p> <p>- In this lesson, you will learn the function of possessive pronouns and how to use them in daily speech, besides practicing adverbs of manner.</p> <p>Proposed applications; Edmodo, note taking app, voice recording app.</p>
<b><i>Condition</i></b>	<p>Learning performance; individual and collaborative learning in small groups.</p> <p>Collaboration settings; face to face collaboration and virtual collaboration.</p> <p>The teacher asks each group to compose a possessive pronouns' song which is similar to the teachers' song.</p>
<b><i>Procedure</i></b>	<p>First, students collaborate with their group mates to create the sentences using taking notes app.</p> <p>Then, each group should invent special melodies for the group's song using voice recording app.</p>

<b><i>Predicted outcome</i></b>	<p>The task is implemented offline during the class time.</p> <p>A unique possessive pronouns' song for each group.</p>
<b><i>Final Product &amp; Evaluation</i></b>	<p>The product is open, and there is no limit for the outcomes since it depends on students' creativity to compose their possessive pronouns' song. Each group gets feedback from other groups and from the teacher during the assessment discussion.</p> <p>First, the teacher explains the difference between adjectives and adverbs of manner by introducing some examples using a presentation during the classroom time.</p> <p>Then, she asks each group to do the assignment which is completing a sheet of exercises with the suitable adverbs of manner. The sheet is posted in Edmodo</p>
<b><i>Homework task</i></b>	<p>Next, each student should try to do the exercise by itself first, then students in each group should run an online chat or call to discuss their solutions using different available apps; e.g., hangout, Skype, online chat, etc.</p> <p>Finally, they submit their final sheets on Edmodo or send it by email to the teacher.</p> <p>More exercises about the topic are posted on Edmodo platform; e.g., listening to a song that reviews the possessive pronouns using the rock music <a href="https://www.youtube.com/watch?v=euQWu0tQW14">https://www.youtube.com/watch?v=euQWu0tQW14</a></p> <ul style="list-style-type: none"> <li>- Online game about possessive pronouns <a href="http://www.eslgamesplus.com/possessive-adjectives-game/">http://www.eslgamesplus.com/possessive-adjectives-game/</a></li> </ul>

UNIT 9	SESSION 1: <i>How to avoid an animal attack?</i>	
Age group: 15-16 years	Level: B1	Time: 45 minutes

<b>1.</b>	3. Practice reading and using second conditional.
<b>2. Aims</b>	
<b>4. Objectives</b>	<p>5. Learn when to use the second conditional; talk about things in the future that are probably not going to be true. Maybe I'm imagining some dream for example and talk about something in the present which is impossible because it's not true.</p> <p>6. Learn how to formulate the structure of the second condition; If + past simple, ... would + infinitive</p> <p>7. Practice speaking using second conditional in a communicative way.</p> <p>8. Practice reading (animal vocabularies)</p>
<b>9. Input</b>	<p>10. Materials; Google sheets with different texts about animals' attack; dog attack, shark attack, bull attack, bear attack and snack attack (texts are extracted from student's book)</p> <p>11. Warm up; A short discussion with the classroom groups;</p> <p>12. Types of animals; wild vs. domestic</p> <p>13. - In this lesson, you will learn to avoid animals attack and the usage of the second condition</p>
<b>14. Condition</b>	<p>15. Proposed applications; Voice recording, Edmodo, Padlet, notetaking app and google drive.</p> <p>16. Learning performance; collaborative learning in small groups. Collaboration settings; face to face collaboration and virtual collaboration.</p>
<b>17. Procedure</b>	<p>18. First, each group should choose one of the google sheets (inserted in Edmodo) and read the text carefully.</p> <p>19. Then, students in each group should work together to select sentences talking about how to avoid the animal attack.</p> <p>20. Next, they should paraphrase the sentences using the second condition structure</p>

<p><b>24. Predicted outcome</b></p>	<p>21. Then, they present all the sentences by creating a mind map or using voice recording to create an audio.</p> <p>22. Finally, the groups share their products on Padlet.</p> <p>23. The task is implemented online during the class time.</p> <p>25. A mind map or audio to present how to avoid animals' attack.</p>
<p><b>26. Final Product &amp; Evaluation</b></p>	<p>27. The content of the groups' products is limited to the sentences mentioned originally in the text. After completing the task, feedback is provided for each group during the assessment discussion.</p>
<p><b>28. Homework task</b></p>	<p>29. Each group should choose at least four questions from the below list which reflect unreal situations and will be posted in Edmodo blog;</p> <p>30. <i>If your doctor told you that you had one year to live, what would you change in your life?</i></p> <p>31. <i>If you were the leader of the world for one week, what would you do?</i></p> <p>32. <i>How would life be different if people did not have thumbs?</i></p> <p>33. <i>How would the world be like if electricity was not discovered?</i></p> <p>34. <i>What would be the picture of the world if we could read each other's mind?</i></p> <p>35. <i>How your life would be different if you moved to another country?</i></p> <p>36. <i>What would you do if you won free flights for a year?</i></p> <p>37. <i>What would happen if you were invisible?</i></p> <p>38. <i>Where would you go if you got the time machine?</i></p> <p>39. Students should collaborate in groups online to create an audio to answer their questions using the second conditional correctly; then they should share their product in Padlet. The cooperation between the group's mates will be organized throughout Edmodo platform, google drive to send and receive their suggestions.</p> <p>40. Other optional activities are;</p> <p>41. Game: search in a puzzle sheet (posted in Edmodo) for possible animal names.</p> <p>42. Listening to a song (contains sentences in second conditional) and complete the text sheet with the missing words.</p>

Appendix J. continued

UNIT 9	SESSION 2: <i>What are your Phobias and fears</i>	
Age group: 15-16 years	Level: B1	Time: 45 minutes

<b><i>Aims</i></b>	Practice listening, speaking and learn some vocabularies.
<b><i>Objectives</i></b>	<ul style="list-style-type: none"> <li>✓ Learn some vocabularies related to phobias and fears.</li> <li>✓ Practice talking about fears using; (I am afraid of, and I have a fear of).</li> <li>✓ Practice listening.</li> </ul>
<b><i>Input</i></b>	<p>Materials; an audio about people fears and phobias.</p> <p>Warm up: the teacher opens a short discussion engaging her students by asking;</p> <p>What makes people scared or afraid? What are things most people are afraid of?</p> <p>- In this lesson, you will learn to express your fears, gain new vocabularies and practice listening.</p>
<b><i>Condition</i></b>	<p>Proposed applications; Voice recording, notetaking app.</p> <p>Learning performance; collaborative learning in small groups. Collaboration settings; face to face collaboration and virtual collaboration.</p>
<b><i>Procedure</i></b>	<p>First, each group listens to the audio carefully from their mobile devices</p> <p>Then, students should collaborate in groups to identify the specific four types of fears mentioned in the audio, and why people have those fears?</p> <p>Students may use note taking app while they are listening, then they discuss their answers.</p> <p>-Another task is; an open discussion in groups where each student could talk about his fears and phobias, trying to answer the following questions; Do you have any kind of phobia? When did it start? what animal do you think is scary? Do you like horror movies? Why?</p> <p>The task is implemented offline and online during the class time.</p>

<b><i>Predicted outcome</i></b>	Some digital notes and oral conversation between group mates about the topic of fears and phobias.
<b><i>Final Product &amp; Evaluation</i></b>	The answers to the listening exercise are closed since there are specific correct words, while the conversations about fears and phobias are open due to the various fears that may different students have. Students get feedback from their groupmates.
<b><i>Homework task</i></b>	Each group should find out the meaning of one of the following phobias; Acrophobia, Agoraphobia, Arachnophobia, Claustrophobia or Glossophobia and submit a clarification supported with a suitable picture.

Appendix J. continued

UNIT 9	SESSION 3: <i>Biography</i>	
Age group: 15-16 years	Level: B1	Time: 45 minutes

<b><i>Aims</i></b>	Practice speaking and writing
<b><i>Objectives</i></b>	<ul style="list-style-type: none"> <li>✓ Learn what is the biography.</li> <li>✓ Learn to speak about your favorite personality; introducing the person, why you admire him/ her, what you have learned from his/ her life?</li> <li>✓ Learn how to write a biography; basic information that should be included, the person’s achievements, relevant, important details in his/ her life and organizing the paragraphs; introduction, body, and conclusion.</li> </ul> <p>Materials; presentation about some celebrities and heroes with their pictures and some tips about writing a biography.</p> <p>Worm up; A short discussion with the groups;</p>
<b><i>Input</i></b>	<ul style="list-style-type: none"> <li>- Each one of us has his/ her own favorite personality; somebody whom you admire and he/ she affects your behavior; he/she could be a singer, an actress, a scientist, etc.</li> <li>- In this lesson, you will learn how to talk about your favorite person and how to write a biography about him/ her.</li> </ul>
<b><i>Condition</i></b>	<p>Proposed applications; notetaking app, voice recording, video maker, Edmodo platform and YouTube app.</p> <p>Learning performance; collaborative learning in small groups. Collaboration settings; face to face collaboration and virtual collaboration.</p>
<b><i>Procedure</i></b>	<p>After the biography presentation and the general discussion in the introduction, students should collaborate with their group mates to complete the task which is: creating a video to introduce their favorite personality by following the steps below;</p> <p>First, have an agreement about the personality (e.g., singer, scientist, philosopher, politician, etc.)</p> <p>Then, search for important events and significant experience in that person’s</p>

	<p>life.</p> <p>Next, organize all information and create a video using video maker app Groups may do it in two ways: -Record the information, save it on your device then combine the voice with the pictures by using the video maker app.</p> <p><b>Or:</b> -Combine the typed notes (text) with the pictures by using the video maker app. 5. Upload the video to YouTube channel through YouTube app.</p>
<b><i>Predicted outcome</i></b>	<p>Biography videos, Christmas videos</p>
<b><i>Final Product &amp; Evaluation</i></b>	<p>The product is open, and there is no limit for the outcomes since it depends on students' creativity to choose, search and present their favorite personality for the classroom task and the Italian Christmas tradition for the assignments. Each group gets feedback from other groups and from the teacher during the assessment discussion.</p> <p>Students should collaborate with their group mates to complete the assignment which is: creating a video to introduce Italian Christmas traditions by following the steps below;</p>
<b><i>Homework task</i></b>	<p>First, search for information about the Italian tradition of celebrating Christmas.</p> <p>Then, pick up suitable pictures to reflect each tradition.</p> <p>Next, record the information, save it and combine the voice with the pictures by using the video maker app.</p> <p><b>Or:</b> -Combine the typed notes (text) with the pictures by using the video maker app. 5. Upload the video to YouTube channel through YouTube app.</p>

## Appendix K. Introductory Sessions

The results from the pre-survey (awareness of mobile technology) indicated that about two third of participated students (64%) have never utilized their devices to complete learning tasks, which means students are not familiar with integrating technology in the classroom. Therefore, these two introductory sessions aim at;

- Providing students with the basic information needed to understand the nature of BYOD program activities and introduce them to the proposed applications. See Appendix H.
- Enhance students' abilities to deal with technical issues (for e.g. downloading mobile applications, sharing files on Google drive, etc.)

### **Session 1**

#### **BYOD program and collaborative learning strategies**

Date: October 2015. Location: Computer Lab in the school. Duration: 90 minutes

Aims:

- Introduce the BYOD concept and the nature of the proposed activities
- Practice f2f and virtual collaboration in small groups
- Learn about the proposed applications and how to download them at home

Materials: PowerPoint presentation, list of the proposed applications

### **Session 2**

#### **Google Drive and Edmodo**

Date: October 2015. Location: Computer Lab in the school. Duration: 90 minutes

Aims: 1. Familiarize the students with Google Drive and its usage:

- Accessing Google Drive
- Working with Docs and Slides
- collaborating with Google Docs:
- sharing files with others (create a share link to Embed on blog)
- Using Google Drive on a mobile device

2. Join the BYOD class on Edmodo platform and practice the main features as students:

- Adding a new post, find a post using the filter options, sending message to the teacher or to any classmate.
- Managing the student's Backpack on Edmodo: adding files, exporting files from Google drive to the Backpack
- Learn how to turn in an assignment.

Materials: [PowerPoint presentation](#)

## Appendix L. Pilot study plans

### Let's talk about music Session 1 (Pilot study)

#### **Aims:**

Practice vocabulary related to music (composer, lyrics, soundtrack, etc.)

-Practice useful structures (A: Do you like ...? B: Yes, I do. /No, I don't. A: So do I. /Neither do I.)

-Learn how to speak about music

Develop students' fluency skills through mimicking their favorite singers' accent and intonation

-Practice some tips to learn English through songs.

Age group: 15-16 years. Level: B1 Time: 45 minutes

#### **Materials:**

Conversation models, QR Codes and the meaning lists, lyrics quiz.

Suggested apps:

Voice recording app, Edmodo app, QR Code Reader (scanner) app, mind map app

Procedure:

**-Introduce** the topic (5 mins): very short discussion;

Do you like music? \ Have you listened to your favorite music\songs this morning?

What kind of music do you listen to? \ How does music influence your mood?

**In this lesson**, we will discuss all these questions and learn more about the subject of music.

Let's start with this activity:

**- Task 1 (10 mins.): Find out about your classmate**

Work in pairs: each pair has two different sets of questions to learn more about each other. After finishing the conversation, each one should record what he\she found out about his\her mate and upload their recording to Edmodo.

**Task 2(15 mins.): Get your words & Look for their meanings** (competition game)

Work in groups: divide your students into four groups, let each group scan their QR codes to get the words, then check the meaning lists and make a recording of their results. The group who finishes first is the winner. At the end of the activity, each group listens to the other

recordings and assesses their results.

**Task 3** (10 mins.): **learning the English language through songs**; brainstorming, free discussion. Teacher asks students:

-Have you ever tried to learn English from songs and music?

-What makes songs an effective tool to learn English? (Why?)

The answers could be Pronunciation & rhythm, everyday language & colloquial speech, English culture. Moreover, songs are emotional & get stuck in the head as well.

-*How can we learn English through songs?* Ask students to create a mind map suggesting all the possible ways. Check with your classmate.

Teacher could emphasize some tips (look at *learning English through songs' sheet*)

**Practice:** (5 min.) for example: ([Tomorrow -by- Annie](#) the song with lyrics)

handout the lyrics quiz papers to your students, give them one minute to read the lyrics on the paper, then they listen to the song and try to fill in the gaps with the missing words from the table. Then they watch the video subtitled with the lyrics and check their work. Ask them: How many words did you get right? Are there any words you don't know?

Homework:

***Our classroom album:*** a collection of the students' favorite songs.

Upload a link to your favorite song with lyrics.

***For more training songs*** with lyrics:

<http://www.esolcourses.com/content/topics/songs/christmas/elementary/white-christmas.html>

extra;

-<https://www.youtube.com/watch?v=x6CNqmpXa-g> Discover What is your music style?

according to your personality.

In this funny test have 10 questions to answer by choosing one answer, then write down the points you get, at the end of the test sum up your points and find out which kind of music suits you.

**Who is my favorite singer?  
Session 2 (Pilot study)**

**Aims:**

- Learn how to describe music.

-Practice the past simple

-Learn how to write a biography.

Age group: 15-16 years. Level: B1 Time: 45 minutes

Materials: list of phrases to describe music.

Suggested apps: Movie maker app, Edmodo app, dictionary app

Procedure:

**-Introduce** the topic (5 mins):

How can we describe music? How do we give our opinion about a piece of music or a song?

**Task 1 (15mins.): How to describe a song or a piece of music**

Students will listen to three different extracts from songs, log into Edmodo and answer the poll questions by choosing the description that matches their opinion followed by a short discussion about the choices).

**Task 2 (25mins.): Create a movie about my favorite singer's biography**

-What is a biography?

-What kind of information can we find in a biography?

*Steps to create a biography movie:*

1. Think of a singer you like and the kind of information needed for the biography.
2. Look for the information online, organize it.
3. Find pictures of the singer of your choice on the web and save them to your device.
4. Use your text and your images to make a short video on the Movie maker app.
5. Upload your video to Edmodo.

**Homework:** Think about a song which tells a story, write down the name of the song and the name of the singer, then *rewrite the story* in your own words.

Appendix M. Pre-pilot survey

**Dear student,**

This survey aims to check your expectation and mobile devices preferences. Please check all the applicable answers.

**1. How do you think bringing your device to school will affect your learning?**

- a) I would be more engaged
- b) I could access digital resources
- c) I could collaborate with my peers
- d) I could submit work to my teacher digitally
- e) Other:

**2. Which of the following device do you personally own and could bring it to school?**

- A. Laptop computer
- B. Android tablet
- C. iPad
- D. Smartphone
- E. Other:

**3. Select the device that matches every statement**

Statements	Laptop computer	Android tablet	IPad	Smartphone	Other
I do not want to bring this to school.					
I would like to bring this to school, but I can't.					
I do bring it to school, but the school limit how I can use it.					
I do bring it to school, but I can't use it for learning purposes unless the teacher gives us the permission.					
I do bring it to school, and I can use it for learning purposes whenever I want.					

Appendix N: **Post-pilot survey**

**Dear student,**

This survey aims to explore your views on the program. Please indicate your level of agreement with each of the following items. **NO RIGHT OR WRONG ANSWERS**, your opinion that counts!

<b>Statement</b>	<b>Strongly agree</b>	<b>agree</b>	<b>Don't know</b>	<b>disagree</b>	<b>Strongly disagree</b>
I like the idea to use my mobile device through the lesson for learning purposes.					
The use of mobile devices makes learning more interesting.					
I know how to search on the Internet through my mobile device.					
I like to collaborate with my classmates when we use our devices.					
I can do the task better if I work alone.					
I know how to download pictures from the Internet to my device.					
I am interested in using a mobile device in other subjects.					
I need special training to use Edmodo					

**I knew how to use following application:**

The name of the app	<b>yes</b>	<b>no</b>
Mindmap		
QR code		
Videomaker		
Edmodo		
Downloading apps on my device		

**Any problems you faced during the sessions**

Thank you

Zahia Alhallak

15/05/2015

Appendix O. The interview Codes and Categories

Categories	Codes	Inter. 1	Inter. 2	Inter. 3	Inter. 4	Inter. 5	Inter. 6	Inter. 7
BYOD program's specialties compared to traditional learning	Interesting	×		×	×		×	
	Simple	×						
	Matching the tech- generation need	×	×				×	
	Organized tasks		×				×	
	Self- responsibilitie s of learning		×			×		
	Different type of tasks & presentation		×				×	
	Improve digital skills		×					×
	New techniques to learn English		×					×
	Utilizing mobile devices & apps		×	×	×		×	×

	Novice		×					
	Motivating	×	×					
	Improve teamwork capabilities				×	×	×	
Categories	Codes	Inter. 1	Inter. 2	Inter. 3	Inter. 4	Inter. 5	Inter. 6	Inter. 7
Managing virtual collaboration	Hangout app	×						×
	Text messages	×						
	Edmodo to consult the teacher	×						
	Edmodo to collaborate with the groupmates	×					×	
	Dividing the task	×				×		×
	Varied mobile apps			×	×		×	
	Whatsapp group				×			×
The best of the program	Collaboration	×	×		×		×	

	Organized learning	×						
	Watching others work & giving feedback	×						
	Learning from others work	×						
	Utilizing mobile devices in learning		×			×		
	Creating videos			×	×			
	<b>Codes</b>	<b>Inter. 1</b>	<b>Inter. 2</b>	<b>Inter. 3</b>	<b>Inter. 4</b>	<b>Inter. 5</b>	<b>Inter. 6</b>	<b>Inter. 7</b>
	Sharing the work with other groups			×				
	Interesting Communication						×	
Difficulties	Wi-fi connection			×				
	Uploading the videos online				×		×	
	Finding time for online collaboration			×				
	Video creation		×					

	Downloading apps							×
	Dividing the task into subtasks							×
Recommendations for further developments	Better wi-fi connection	×	×		×	×		×
	Involve familiar apps (WhatsApp)						×	

Appendix P. Pre- survey

Dear students,

The aim of this survey is to reflect your knowledge and awareness of mobile technology

**1. Which of the following device do you personally own and could bring it to school?**

- A. Android tablet
- B. iPad
- C. Smartphone
- D. Other:

**2. Have you been allowed to bring your mobile device to school for learning purposes?**

- A. Yes, at least once
- B. No, never

**3. Do you know how to use Google Drive to save your files?**

- A. Yes
- B. No

**4. Do you know how to use Google Drive to share your files?**

- A. Yes
- B. No

**5. Have you used Google Drive to complete an assignment with your classmates?**

- A. Yes
- B. No

**6. Are you familiar with the following applications?**

<b>The application</b>	<b>Yes</b>	<b>No</b>
Edmodo		
QR reader		
QR generator		
Note-taking		
Mind map		
Voice recorder		
Padlet		
Video maker		
YouTube		

**7. Have you used any of the following applications for learning purposes?**

<b>The application</b>	<b>Yes</b>	<b>No</b>
Edmodo		
QR reader		
QR generator		
Note-taking		
Mind map		
Voice recorder		
Padlet		
Video maker		
YouTube		

## BYOD Policy/Agreement

### Introduction

As new technologies continue to change the world in which we live, they also provide many new and positive educational benefits for learning. Therefore, a new program will be implemented in your classroom. In this initiative, Bring Your Own Device (BYOD), students are encouraged to bring their own technology devices to school to assist their learning experiences.

### Definition of “Technology”

For purposes of BYOD, “Technology” means electronic handheld smart devices, that can be used for wireless Internet access, image capture/recording, sound recording, and information transmitting/receiving/storing, etc. Some devices that have been defined for BYOT include Apple iPad, Tablets, and smartphone.

### Internet sources

The Internet gateway provided by the school, and 3G privet Internet, which modified to be secure for students’ use, are available for students in the classroom while Personal Internet connective devices, cell phones /cell network adapters are not permitted to be used during the school day.

### Security and Damages

Keeping the device secure and updated is on students’ shoulders. Damaged or stolen device issue will be managed through the administrative office like other personal objects. It is recommended to customize your device to be easily identified from others.

### BYOD Student Agreement

When students respect the use of technology, they will benefit from various educational materials and enrich the whole learning environment. To achieve that each student must agree to the following conditions:

- The technology must be in the silent mode in the classroom.
- The technology may not be used for non-instructional purposes.
- The student confirms teacher's instructions related to handling the technology during the lessons (e.g., teacher’s request to close the screen or shut it down)
- The student acknowledges that the school's network filters will be applied to one's connection to the Internet.
- The list of apps needs to be downloaded at home.
- The student should keep his\her personal information (including home/mobile phone number, mailing address, and user password), **private**
- The student should show **respect** for himself and others when using technology.

As a student who accepts to participate in BYOD program, I understand and will respect the above policy and guidelines. I further understand that any abuse is unethical and may result in the loss of my technology privileges in the classroom.

Student's name : Signature:

Appendix R. BYOD agreement (Italian version)

## **Politica BYOD / Accordo**

### **Introduzione**

Come le nuove tecnologie continuano a cambiare il mondo in cui viviamo, ma anche fornire molti nuovi e positivi benefici educativi per l'insegnamento in classe. Pertanto, abbiamo deciso di implementare Bring Your Own dispositivo (BYOD) a scuola. In questa iniziativa, gli studenti sono invitati a portare i propri dispositivi tecnologici a scuola per aiutare i loro esperienze di apprendimento. Questo documento è un contratto che ci atterremo come stabiliamo il programma all'interno della vostra scuola.

### **Definizione di "tecnologia"**

Ai fini del BYOD, "Tecnologia", un wireless di proprietà privata e / o portatili apparecchiature tenuto in mano elettronico che include, ma non è limitato a, esistenti e sistemi di comunicazione mobile e le tecnologie intelligenti, dispositivi Internet portatili emergenti, che può essere utilizzato per parola trattamento, accesso wireless a Internet, immagine cattura / registrazione, registrazione del suono e le informazioni di trasmissione / ricezione / l'archiviazione, etc. Alcuni dispositivi che sono stati definiti per BYOT includono Apple iPad, tablet e smartphone.

### **Internet**

Solo il gateway Internet fornito dalla scuola è accessibile mentre nel campus. Dispositivi connettivo Internet personale, telefoni cellulari / schede di rete cellulare non è consentito utilizzare per accedere a fonti Internet fuori in qualsiasi momento.

### **Sicurezza e danni**

La responsabilità di mantenere il dispositivo sicuro spetta al singolo proprietario. La scuola non è responsabile per qualsiasi dispositivo rubato o danni ad esso nel campus. Se un dispositivo viene rubato o danneggiato, sarà gestita attraverso l'ufficio amministrativo simile ad altri oggetti personali che sono interessate in situazioni simili. Si raccomanda che le pelli (decalcomanie) e altri tocchi personalizzati vengono utilizzati per identificare fisicamente il dispositivo da altri. Inoltre, custodie protettive per la tecnologia sono incoraggiati.

### **Accordo BYOD Student**

L'uso della tecnologia per fornire materiale didattico non è una necessità, ma un privilegio. Uno studente non ha il diritto di utilizzare il proprio computer portatile, cellulare o altro dispositivo elettronico, mentre a scuola senza l'approvazione del personale scolastico. Quando abusato, privilegi saranno portati via. Quando rispettati, essi potranno beneficiare l'ambiente

di apprendimento nel suo complesso.

*Inoltre, lo studente deve accettare le seguenti condizioni:*

Lo studente assume la piena responsabilità per il proprio dispositivo dotato di tecnologia. La scuola non è responsabile per la sicurezza della tecnologia di proprietà degli studenti.

- La tecnologia deve essere in modalità silenziosa, mentre nei campus scolastici e durante la guida scuolabus.
- La tecnologia non può essere utilizzata per truffare su incarichi o test, o per fini non didattici.
- Lo studente accede solo i file sul computer o su Internet i siti che sono rilevanti per il curriculum in aula.
- Lo studente è conforme alla richiesta di un insegnante per spegnere il computer o chiudere la schermata.
- Lo studente riconosce che i filtri di rete della scuola saranno applicate alla propria connessione a Internet e non tenterà di bypassare loro
- Lo studente capisce che portare nei locali della scuola o infettare la rete con un virus, Trojan, o un programma progettato per danneggiare, alterare, distruggere, o fornire l'accesso ai dati o informazioni non autorizzate è in violazione della politica e si tradurrà in azioni disciplinari
- Lo studente si rende conto che il trattamento o l'accesso alle informazioni sulla proprietà della scuola correlate a "hacking", le politiche di sicurezza alterazione, o di rete bypass è in violazione della politica AUP e si tradurrà in azioni disciplinari.
- Il distretto scolastico ha il diritto di raccogliere ed esaminare qualsiasi dispositivo che è sospettato di causare problemi o è stata la fonte di un'infezione attacco o un virus.
- Lo studente si rende conto che la stampa da dispositivi tecnologici personali non sarà possibile a scuola.
- L'elenco delle applicazioni devono essere scaricati a casa.
- Lo studente deve mantenere la sua \ propri dati personali (inclusi / numero di casa mobile di telefono, indirizzo postale, e la password utente) e quella degli altri privati.
- Lo studente deve mostrare rispetto per lui stesso e altri quando si utilizza la tecnologia tra cui i social media.

Come un studente di ----- scuola, ho capito e farò rispettare la policy e le linee guida di cui sopra. Capisco inoltre che ogni violazione è immorale e può provocare la perdita della mia rete e / o privilegi laptop così come altre azioni disciplinari.

Progressive procedure disciplinari:

Nella misura adeguata alla situazione, dirigenti scolastici e insegnanti seguiranno un processo disciplina progressivo con il seguente squillato:

- Attenzione e / o di consulenza con i dirigenti scolastici
- Perdita dei privilegi.
- Time out
- Rimozione temporanea o permanente di attività o la classe

Nome dello studente:

Firma:

Appendix S. Students taking part in the program (F2F collaboration activities)

