The Effect of a Proposed Blended Project-Based Learning Program on Developing the 4Cs Skills for Secondary Stage Students

BY

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Abstract

The purpose of this study was to investigate the effect of a proposed blended project-based learning program on developing the 4cs skills (critical thinking, creative thinking, communication, and collaboration skills) for secondary stage students. The study employed the one-group pretest-posttest quasi – experimental design. The participants were 30 first year secondary stage students at Hassan Abu Bakr Distinguished Governmental Language School in El-Qanater Elkhairya Educational Administration in Qualybia Governorate. The instruments of the study included a list of critical thinking skills, a list of creative thinking skills, a list of communication skills, a list of collaboration skills, a critical thinking test, a pre- post creative thinking test, an observation checklist for communication skills and an observation checklist for collaboration skills. The pre/post critical thinking test, the creative thinking test, and the observation checklists for both communication and collaboration skills were pre administered to the study group. Then, the study group was trained through the proposed blended project-based learning program to develop the 4 Cs skills (critical thinking, creative thinking, communication, and collaboration). The measurement instruments of the study were post administered to the study group. Findings of the study revealed that the blended project-based learning program proved to be effective in developing the 4Cs skills for the study group.

Key words: Project based learning - blended learning, 4Cs skills.

فاعلية برنامج مدمج مقترح قائم على التعلم المبني على المشروعات في تنمية مهارات 4Cs لدى طلاب المرحلة الثانوية

إعداد

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المستخلص

هدفت هذه الدراسة الى التحقق من فاعلية برنامج مدمج مقترح قائم على التعلم المبني على المشروعات في تنمية مهارات 4Cs (التفكير الناقد – التفكير الإبداعي- التواصل – التشارك) لدى طلاب المرحلة الثانوية . استخدم الباحث في هذه الدراسة المنهج شبه التجريبي للمجموعة الواحدة بقياس قبلي وقياس بعدي. وتكونت مجموعة الدراسة من ٣٠ طالب بالسنة الأولى بالمرحلة الثانوية بمدرسة حسن أبو بكر الرسمية المتميزة للغات بالقناطر الخيرية بمحافظة القليوبية. واشتملت أدوات الدراسة على قائمة بمهارات التفكير الناقد، قائمة بمهارات التفكير الإبداعي، قائمة بمهارات التواصل، قائمة بمهارات التشارك، اختبار قبلي بعدي للتفكير الناقد، اختبار قبلي بعدي للتفكير الإبداعي، بطاقتي ملاحظة لقياس كلا من مهارات التواصل والتشارك للفئة المستهدفة. تم تطبيق اختبار التفكير الناقد واختبار التفكير الإبداعي وبطاقتي الملاحظة الخاصة بالتواصل والتشارك على مجموعة الدراسة ثم تم تدريب مجموعة الدراسة من خلال البرنامج المدمج المقترح القائم على التعلم المبني على المشروعات لتنمية مهارات 4Cs (التفكير الناقد – التفكير الإبداعي- التواصل – التشارك). ثم طبقت أدوات الدراسة بعديا على مجموعة الدراسة. أظهرت نتائج الدراسة فاعلية البرنامج وتحققت فروض الدراسة مما يعني ان البرنامج المدمج المقترح القائم على التعلم المبني على المشروعات فعالا في تنمية مهارات 4Cs (التفكير الناقد – التفكير الإبداعي- التواصل – التشارك) لدى مجموعة الدراسة.

الكلمات المفتاحية: التعلم القائم على المشروعات – التعلم المدمج –مهارات 4Cs

1. Introduction

One of the essential features that characterizes the 21st century is the information and technology revolution that is reflected in the availability of various sources of information and technology. Such revolution has influenced the education system and changed the way education used to be in the previous decades. (Sandra, 2020). Moreover, these changes may have a great influence on the future of students which in turn require education systems to provide them with the essential 21st century skills to make them able to cope with the modern global life aspects caused by such changes (Afandi et al., 2019).

These 21st century skills that have become essential to students all over the world have been classified by Pardede (2020) into three main groups: the first group covers skills known as learning and innovation. The second group covers skills known as literacy skills. The third group covers skills known as life skills. The first group that includes learning and innovation skills is mainly concerned with skills of collaboration, communication, creative thinking, and critical thinking. The second group that includes literacy skills focuses on students' ability to deal with both information and technology. The third group that includes life skills involves both personal and professional skills that are required to be part of our everyday life.

The learning and innovation skills known as the four Cs skills should be learned and focused on in the 21st century. These four Cs skills are critical thinking, creative thinking, collaboration and communication (Rusdin & Ali, 2019). Such skills have been also determined by the partnership for the 21st century skills as the super skills learners are supposed to learn and acquire before they finish their studies along with the traditional skills they already learn in their school content subjects (P21, 2015). Therefore, the instructional methods of the 21st century should be adopted to enhance and improve such critical and essential skills (Osman, 2016).

One of the instructional methods and approaches that can enhance the learning process is project-based learning. PBL has shifted students' learning to focus on challenges and concerns of real life examples and to provide them with opportunities to ask questions, think, collaborate, reflect, apply the information and knowledge they acquire, find solutions to problems, and be flexible and adaptable learners which, in turn, target the 4 Cs skills (Hmelo-Silver, 2004). In the same context, Estrada Oliver

et al. (2020) confirmed that PBL is a teaching model that can enhance the necessary 4Cs skills of the 21st century as it provides students with a constructivist education centered around projects which, in turn, engages students in several inquiry and critical thinking processes as well as collaboration and communication processes to reach their final goal represented in creating a project.

Due to its several advantages and positive impact on students, project based learning received great and big attention and investigations among scholars and educators in the 21st century (Vaca Torres & Gómez Rodríguez, 2017). In this regard, Grant (2002) reflected that using PBL can assist students in developing a variety of necessary and crucial abilities, including communication, different sorts of thinking, problem solving, and negotiation. In the same vein, Kapp (2009) claims that it can help students improve their critical thinking, cooperation, and problem-solving abilities.

For Li et al. (2015) integrating PBL with second or foreign language learning instruction is an essential requirement for EFL and ESL learners to better address their learning. PBL was adopted in several circumstances where second and foreign language instruction is used by many scholars and educators such as (Solomon, 2003; Sultan & Javaid, 2018) to enhance students' language skills. Their studies revealed that PBL provided students with opportunities to ask questions, debate ideas, analyze information, draw conclusions, collaborate, and communicate well. In the same line of thought, Syarifah and Emiliasari (2019) added that in addition to developing and enhancing students' language skills, PBL can also enhance creative thinking and critical thinking.

To better maximize the benefits of PBL especially nowadays, blended learning will be adopted in this study. According to Porter et al. (2016) blended learning is one of the promising and uprising approaches that can enhance and develop learning as it provides students with a combination of face-to-face learning experience in the regular classroom setting and online learning tools that can increase and maximize learning time and can cope with the spirit of the 21st century. Moreover, Xu et al. (2020) think that blended learning is considered to be an exceptional approach as when implemented properly, teachers can still make use of the conventional face to face instruction along with technology mediated online learning tools and environments.

1.1 Context of the problem

As stated earlier, the 4 Cs skills are very important and necessary for students in the Twenty-First century. Despite the essentiality of such skills, many English language learners in Egypt do not learn these skills properly. This was evident for the researcher due to the pilot study conducted by him on a number of 40 secondary school teachers. The pilot study has been delivered in the form of a survey that included 16 items based on the practices of the 4Cs skills (Critical thinking, creative thinking, collaboration, and communication) to check to what extent English secondary school teachers in Egypt include and target these skills in their teaching practices along with the four language skills. The data revealed the following: 90 % of the teachers included in the survey do not include or target creative thinking; 80% of the teachers do not target critical thinking skills; 75% of the targeted teachers do not focus on collaboration and 60% of the targeted teachers do not design communicative activities in the classrooms. The results varied from one skill to another as presented, but in general it can be concluded that the 4Cs skills are not targeted or given the appropriate attention by most secondary school teachers. They later reported that they focus more on the skills that are assessed in the final assessment.

Moreover, the previous related studies that were investigated and reviewed confirmed the necessity of targeting these 4Cs skills to graduate learners to cope with the new demands of the twenty- first century. For example, (Caine, 2011; Huang et al., 2010); Van Roekel and Association (2014) confirmed that the 4Cs need to be fully targeted to produce citizens and employees who can cope with the requirements of the 21st century.

1.2 The statement of the problem

The study problem can be identified in "secondary stage students have deficiencies in the 4Cs skills of the 21st century." In order to respond to this problem, this study has attempted to answer the following main question:

"How can a proposed blended project-based learning program be designed to develop the 4Cs skills among secondary stage students?"

The following sub-questions were derived from the main question:

1- To what extent do first year secondary stage students acquire the 4Cs skills?

2- What are the four Cs sub skills that are appropriate for first year secondary stage students?

3- What are the features of the proposed blended project-based learning program to develop the 4C s skills among first year secondary stage students?

4- How far is the proposed blended project-based learning program effective in developing the 4Cs skills among secondary stage students?

1.3 Hypotheses of the study

Based on the discussion of the literature and related previous studies, the following hypotheses have been stemmed:

1- There would be a statistically significant difference between the mean scores of the study participants on the pre and post application of the overall critical thinking test and on each skill separately in favor of the post application.

2- There would be a statistically significant difference between the mean scores of the study participants on the pre and post application of the overall creative thinking test and on each skill separately in favor of the post application.

3- There would be a statistically significant difference between the mean scores of the study participants on the pre and post application of the overall observation checklist of communication skills and on each skill separately in favor of the post application.

4- There would be a statistically significant difference between the mean scores of the study participants on the pre and post application of the overall observation checklist of collaboration skills and on each skill separately in favor of the post application.

1.4 Purposes of the study

The purposes of the study included the following:

1- Examining the effect of the proposed blended project-based learning program on developing first year secondary stage students' critical thinking skills.

2- Examining the effect of the proposed blended project-based learning program on developing first year secondary stage students' creative thinking skills.

3- Examining the effect of the proposed blended project-based learning program on developing first year secondary stage students' communication skills.

4- Examining the effect of the proposed blended project-based learning program on developing first year secondary stage students' collaboration skills.

5- Examining the effect of the proposed blended project- based learning program on developing first year secondary stage students' overall 4 Cs skills.

1.5 Significance of the study

The significance of the study stems from the following implications:

1- The study may be beneficial for first year secondary school stage students as it helps them improve their 4Cs skills.

2- The critical thinking list, creative thinking list, collaboration observation checklist and the communication observation checklist might be beneficial for EFL educators and scholars.

3- The study may be important for EFL curriculum designers and developers who seek to integrate the 4 Cs skills and the proposed blended project-based learning program into EFL curriculum and textbooks.

1.6 Delimitation of the study

This study is delimited to:

1- A group of students in their first-year secondary school stage who study English as a foreign language at Hassan Abu Bakr Distinguished Governmental Language School. A class of 30 students were chosen randomly to be the study group.

2- Some collaboration, communication, creative thinking, and critical thinking skills appropriate for first year secondary stage students.

3- A model of project-based learning known as the 10 Cs model of project-based learning TESOL curriculum.

4- A limited time to carry out the program (10 weeks) during the second semester of the academic school year 2020-2021.

1.7 definitions of terms

1.7.1 The 4Cs skills

According to Fadel and Trilling (2010) the four Cs skills are collaboration, communication, critical thinking and creative thinking. For Osman (2016), communication, collaboration, critical thinking and creative thinking formulate the four Cs skills that he believes to be necessary for students to master in the 21st century. In this study, the 4Cs skills include collaboration, communication, critical thinking, and creative thinking skills that students should develop through using

blended project-based learning to better address the demands of the 21st century.

1.7.2 project based learning

Estrada Oliver et al. (2020) defines PBL as an instructional model that can enhance the necessary skills of the 21st century through a constructivist education that is centered around a project. Markham et al. (2008, p. 4) PBL as a systematic teaching strategy in which students learn information and skills through an inquiry process that mainly focuses on deep authentic questions and projects. In this study, PBL is operationally defined as a 10-stage model that seeks to engage students to address questions, issues or solve problems in blended learning environments that combine both face to face and online learning.

1.7.3 Blended learning

According to Bonk and Graham (2012, p. 5)blended learning is a that type of instruction which combines both face to face instruction with computer mediated instruction. Also, Garrison and Kanuka (2004, p. 96) defined blended learning as the purposeful incorporation of face-to-face learning experiences that take place in the classroom and online learning experiences that take place in an online learning environment. In this study, blended learning is a type of learning that combines between physical learning and online learning through some video conferencing applications to better deliver PBL to enhance the 4Cs skills.

2. Review of Literature

The following section discusses the main variables of the study represented in the 4Cs skills which include critical thinking, creative thinking, collaboration and communication, project-based learning, and blended learning.

2.1 The 4Cs skills

According to the National Education Association (2015) as cited in Erdoğan (2019), what was considered to be good education in the past is not necessary to be good education today. In the past, students were only required to master three main skills mainly reading, writing, mathematics, but due to the new demands of the 21st century, new skills have been added to what learners should learn to cope with the updated requirements of the present century.

According to Morgan (2015), the partnership for the Twenty-First Century (P21) created a framework that aimed at defining the skills and abilities necessary for learners to acquire to be successful in their schools

and their careers. These skills were formulated in four categories in the framework. These four categories are content and knowledge skills, learning and innovation skills, information media and technology skills and life and career skills. (P21, 2015). Traditional topic knowledge and abilities, as well as global awareness, are included in content and knowledge skills or core subjects. Creative thinking, critical thinking, problem solving, communication, and collaboration are examples of learning and innovation skills. Informational literacy and media and technology literacy are two types of information, media, and technology skills. Intrapersonal skills such as flexibility and adaptability, initiative and self-direction, productivity and accountability, leadership and responsibility are examples of life and professional skills. (Geisinger, 2016).

According to P21 (2015), the 4Cs skills are those 21st century skills associated with learning and innovation skills that include critical thinking, creative thinking, communication and collaboration. These skills are essential to students in the 21st century as they help students be well prepared to life and work after they finish school. Such skills are not the main responsibility of a single school subject, yet it should be embedded in all school subjects and disciplines. In the same context, Van Roekel and Association (2014) agreed that the 4Cs skills should be integrated into the various subjects to graduate learners who are well prepared for living and working in the present century.

In the same line of thought, Cohen (2019) considered the 4Cs skills to be the core of the learning process that students should receive in the Twenty- First Century. These skills are essential for learners at all stages. Larson and Miller (2011) added that such skills should be included within the different subjects students receive rather than taught as separate subjects that deal only with the 4 Cs skills. For them, these skills are not new, but their importance has grown more and more due to the new requirements and demands of the 21st century which require all workers to be the types of persons who are capable of finding and analyzing information, making decisions, and creating new ideas.

In addition, Erdoğan (2019) stated that recent research in the field of TEFL has confirmed that it is very important to develop English language learners to be critical thinkers and creative persons as well as efficient language users. In the same context, Fandiño Parra (2013) suggested that along with the four language skills, EFL students should

be taught how to interpret complex perspectives, make judgements and decisions, and collaborate creatively with others. The four language skills can be better gained when students are obliged to investigate an EFL topic, discuss or debate the topic with classmates, and write about their thoughts on the topic. They also can make short movies, act in plays, find solutions to problems which in turn enhance their communication, creativity, critical thinking, and collaboration skills.

2.1.1 Critical thinking

Critical thinking is one of the four Cs skills. Critical thinking has recently been a deep focus for most workshops, seminars and conferences that are held to discuss issues related to education (Báez, 2004; Florea & Hurjui, 2015; Khatib et al., 2012). It is viewed as a super Twenty-First Century skill as it helps learners to think deeply as well as enable them to resolve problems (Kivunja, 2015). As a skill, critical thinking should be acquired early. It should be acquired starting from childhood and can be developed lifelong (León, 2015).

Critical thinking is a mental process that involves several cognitive processes. As a concept, it was tackled in a different way by several scholars and educators (Halvorsen, 2005). These definitions range in complexity from the most basic to the most complicated. According to (Kivunja, 2015), critical thinking is the capability of an individual to use some cognitive processing skills including application, analysis, and evaluation. In the same line of thought, the Californian National Council for Excellence defined it as a cognitive ability that involves knowledge, comprehension, application, analysis, synthesis, and evaluation (NCECT, 2014). Sydney (2014), presented a very simple definition for critical thinking considering it to be that type of thinking that has a purpose. Despite these several definitions found in literature about critical thinking, there is an agreement among educators and scholar that critical thinking is considered a meta-cognitive process (Saleh, 2019).

Reviewing literature related to critical thinking has revealed that many educators and scholars strongly believe that critical thinking is an essential skill in the Twenty- First Century for several reasons. The 21st century is characterized with the ongoing changing of information which requires, in turn, the educational system to enable students to manage and deal with problems they are not familiar with, to be open minded, to have the ability to ask questions and to think logically (Kivunja, 2015).

Fadel and Trilling (2010) added that developing students' critical thinking helps them to think effectively and develop one's abilities to make logical decisions.

According to Lai (2011), critical thinking skills have to be developed by students in the Twenty- First Century to be able to become both active and effective learners to evaluate different opinions and views as well as improve problem- solving skills. In the same context, Pardede (2019) highlighted that critical thinking skills have to be developed by learners to be able to question, analyze, criticize, reflect, and synthesize which in turn will make them be able to evaluate ideas, concepts and viewpoints and accept or refuse them based on their reasoning processes.

Due to the nature of the 21st century which is represented mainly in the intensity of the flow of information, students should enhance critical thinking skills to choose the correct information in the present day. The information has become more reachable and accessible nowadays compared to the previous century which, in turn, required learners to have critical thinking to choose, evaluate, use the correct information, as well as ignore the wrong information (Yaralı & Aytar, 2020).

As for critical thinking sub-skills, P21 (2015) stated that critical thinking sub-skills include inductive and deductive reasoning; evidence analysis and evaluation; arguments; claims; different points of view; information interpretation and conclusion drawing; reflection on learning experiences and processes. On the other hand, Maneen (2016) added the following critical thinking sub-skills: judging or evaluating information, questioning, and decision making. Moreover, Greenberg (2014) confirmed that critical thinking sub-skills includes questioning, examining, developing a hypothesis, analyzing, reflecting, comparing, evaluating and presenting an opinion. Also, Starkey (2004) stated that critical thinking sub-skills include the following: making observations, ask relevant questions, use several resources to search for information and reach conclusions, examine beliefs, assumptions, and arguments, and make correct decisions and judgments.

For Maneen (2016) Some critical thinking skills, such as analyzing, understanding, and solving problems, may become more significant than the other topic knowledge skills that students learn in school when it comes to achieving career success as well as success in higher education.

Moreover, the most required jobs of the 21st century will demand students who are critical thinkers as well as those who can solve complex problems.

Many current studies in the field of TEFL such as that of ((Rashid & Hashim, 2008; Rear, 2017); Sadli (2002) confirmed that critical thinking skills are very important for ESL and EFL learners and that many learners in many parts of the world do not receive the appropriate instruction on critical thinking. Therefore, ESL and EFL teachers are required to focus on critical thinking and make it part of their instructional practices. Also, they have to be aware in advance of the complexity of critical thinking due to social, cultural, and contextual considerations. Therefore, ESL and EFL teachers are encouraged to select appropriate strategies that can be adopted in order to help in developing this necessary skill among ESL and EFL students (Rear, 2017; Saleh, 2019).

Enhancing EFL learners 'critical thinking helps them be active and influential life- long learners. Also, critical thinking skills help students understand, and evaluate different points of views, solve problems, and take charge of themselves in a way that turn them into independent thinkers (Lai, 2011). In the same regard, Pardede (2019) added that learners are required to develop their critical thinking to be able to ask questions, analyze information, evaluate different perspectives with the aim of accepting or ignoring thoughts, conceptions and points of views.

Assessing critical thinking started to be used by educators and scholars long time ago. One of the valid and reliable examples of assessing such skills has been the Cornell Critical Thinking Tests (CCTT). This exam contains questions that are based on actual-life circumstances. Assumption, deduction, induction, and observations are among the basic parts of the test. (Bridge, 2019).

Critical thinking is strongly connected to the other Cs skills which are all equally important for students in the 21st century. Many educators and scholars state that when a student is engaged in a deep-thinking process, he or she employs both critical and creative thinking. Also, critical thinking requires learners to use other skills mainly, communication and collaboration as they are required to examine, analyze, interpret and evaluate information as well as being engaged in team work (Association, 2010).

2.1.2 Creative thinking

Creative thinking is considered one of the four Cs skills of the Twenty-First Century along with critical thinking, collaboration, and communication. Creative thinking requires students to construct knowledge, solve problems, and keep up with the changes that take place in our global world (Gursoy & Bag, 2018). As being one of the 4Cs skills, creative thinking has become an issue that dominated educational discussion among educators, scholars and researchers for decades (Kaufman & Sternberg, 2006).

Despite the fact that creativity is used interchangeably by many educators and scholars with creative thinking, there is actually a little difference between them. Creativity is often related to the products or processes resulting from generating new ideas, and new thoughts whereas creative thinking is associated with the thinking skills that enable persons to generate new ideas, thoughts, and objects. Therefore, creativity can be considered as an outcome of creative thinking skills (Amabile, 1998).

Reviewing literature related to creative thinking has revealed that there are several definitions of it. According to Sternberg (2001), creative thinking includes a group of skills necessarily required to produce both new and beneficial ideas. In the same regard, Cropley (2001) stated that any definitions for creative thinking should associate it with new ideas, impact, and ethical values. For him, new ideas mean producing something different with abstract ideas or concrete objects. On the other hand, impact means that creative thinking products, ideas and actions should be useful. As for ethical values, creative thinking should be useful and beneficial for people and life.

According to P21 (2015), students need to enhance their creative thinking in order to be able to create and innovate before they finish high schools in order to be qualified and eligible for the workplace conditions of the 21st century. In the same context, Gardner (2008) stated that creative thinking is as essential for learners as reading and writing. It is essential for learners to develop their minds and find appropriate solutions for the challenging problems.

Creative thinking is essential for both personal and professional success(Maneen, 2016). It is as important as learning reading and writing (Robinson, 2006). For Gardner (2008) creativity is important as it develops students' minds to be able to explore, challenge and solve

problems. Moreover, creative thinking makes people more stimulated, open minded to creative thoughts and ready to make risky decisions which can be done through asking questions and learning new things (Reiter-Palmon et al., 2014).

For Rababah et al. (2013), creative thinking paves the way for learners to do more essential roles regarding both their academic and professional lives. The instructional process in itself is a creative process which requires students to be creative. In this regard, Kabilan (2000) stated that creative thinking is an important component for all learners and ESL / EFL students in particular as it requires learners to use their cognitive processes to create non traditional and original ideas. Also, research has found that there are positive relationships between learning a foreign language and creative thinking as students who learn a foreign language outperformed those who did not learn a foreign language in creative thinking tests(Ghonsooly & Showqi, 2012).

According to P21 (2015) framework, there are three components for creativity. These three components are to think in a creative way, to work in a creative way with other people, and to carry out innovative ideas. To think in a creative way involves generating ideas, making novel thoughts, elaborating, analyzing, and evaluating thoughts. On the other hand, to work in a creative way with other people includes enhancing and delivering novel thoughts, having an open mind to understand and accept others' views and flexible to accept different visions, and showing originality. Finally carrying out innovations involves implementing creative ideas to create products.

According to Ming (2005) there are three main sub skills for creative thinking. They are fluency, flexibility, and originality. Based on these sub-skills, a widespread test known as Torrance Test for Creative Thinking (TTCT) was designed. According to Gursoy and Bag (2018), Torrance has worked on assessing creative thinking skills through an instrument known as Torrance Tests of Creative Thinking (TTCT). Ming (2005) added that in this test, fluency indicates the several ideas and thoughts a person is able to come up with. Flexibility, on the other hand, relates to the many concepts that a person is able to generate. The term "originality" refers to a person's ability to come up with novel ideas.

Assessing creative thinking has been in action for several periods of time. The prominent, valid, and reliable example of assessing creativity has been the Torrance Tests of Creative Thinking (TTCT).

This creative thinking test included two parts: verbal, and figural. The figural part has three parts: picture construction, picture completion and parallel lines and they ask students to modify and title different drawings and shapes. The verbal section includes seven parts ranging from guessing reasons, outcomes, unexpected applications to just suppose (Bridge, 2019).

To conclude, it can be said that creative thinking deeply relates to the other Cs skills. Creative thinking requires teamwork, interpersonal skills, communication, and collaboration. Moreover, creative thinking and critical thinking are two interrelated terms (Association, 2012).

2.1.3 Communication

Communication is the third skill of the Twenty-First Century skills known as the 4 Cs skills. It refers to any mutual effort between two people to negotiate meaning in a variety of contexts. (Rodríguez Cervantes & Roux Rodriguez, 2012). According to Pardede (2020), language is basically functioned as a means of communication which involve sharing thoughts and ideas with others. In the same context, P21 (2015) presented a definition for communication as the ability to communicate successfully in a number of forms and circumstances using oral, writing, and non-verbal communication skill. Thus, the main aim of English language teaching is to enable students to effectively communicate their ideas and thoughts in English.

However, communication in the 21st century has become more complex and includes more than the traditional definition represented in the oral and written types of communication. Actually, the spread of technology and the new innovations of the 21st century have changed the concept of communication to include oral, written and interpersonal forms and made it an essential part of one's life that includes knowledge, values, attitudes, for several aims such as informing, instructing and persuading in several conditions, and contexts (Pardede, 2020).

To be more meticulous, communications involve three types: oral, written, and interpersonal. Using intonations and articulating words, speech volume, using an appropriate level of the language when communicating, and verbal rewarding are all the main components of oral communication. On the other hand, identifying main points and facts, delivering a written message through paragraphs and essays, and using correct grammar and spellings are all the main components of written communication. As for the non-verbal language, it includes using

your body language, eye contact, and facial expressions. (Ainunningsih, 2018).

The 21st century requires students not just to deliver information, but also to generate knowledge and practice inquiry which in turn make communication skills more important today than before. This concept turns communication skills to involve negotiations, explanation of ideas, and several other forms of human interaction (Levy & Murnane, 2012).

According to Pope (2015), communication skills are very important to be taught in the classrooms as they are vital to better make students successful not just at schools, but also at life. On the other hand, Frymier (2005)in his study found out that learners who demonstrated good communication skill were efficient learners, and were reported to show higher performance in their classrooms.

According to(Hussainy et al., 2012), the assessment of the communication skills is not as easy job. It is more likely to be a subjective process that may lead to unfair results and make students feel that their assessments are not equal. Therefore, it is recommended to use more objective tools such as observation checklists or rubrics when assessing communication skills.

2.1.4   Collaboration

Collaboration is one of the Twenty- First Century skills that has received great attention during the previous decade by many scholars and educators(Caine, 2011; Wagner, 2008). Also collaboration was considered one of the four essential skills of the Twenty First Century known as the four Cs skills (Association, 2012).

According to P21 (2015, p. 20), collaboration is defined as the ability to work efficiently with different groups that may be diverse, yet these teams are flexible and willing to negotiate and compromise to achieve a shared goal. Team members share together the responsibility of achieving the shared goal with complete respect and value to member contributions. For Webb and Mastergeorge (2003), collaboration requires learners to be engaged in the processes where they are supposed to work together on the same task instead of working separately or individually.

Collaboration has recently become a highly desirable skill. Many scholars and researchers conducted surveys on employers to rate the importance of this skill. The majority of the employers included in the survey revealed that team work as one of the collaboration skills is highly important for school graduates who seek to join the labor market

upon graduation (Associates, 2015). Therefore, it is highly recommended to develop collaboration skills in students.

In fact, there is a limitation of tools that are used in the process of assessing collaboration skills. Most efforts have been made to assess both individual and group collaboration. Some of the tools were very simple such as video recording students during a learning task that requires collaboration and use a code scheme to mark both individual and group interactions. Also, rubrics and classroom observation checklists have been used (Bridge, 2019; Chiu & Khoo, 2003).

Collaboration is strongly connected with the other 4Cs. Collaboration as a skill requires students to be involved in critical thinking, creative thinking, and communication. Collaboration and communication as two of the 4Cs cannot be separated from each other. They are always together and go hand in hand (Pardede, 2020).

To better incorporate and develop the 4Cs skills, educators and scholars can make use of some instructional methods, strategies and approaches that may help them achieve this goal. One these pedagogical strategies is project-based learning (Levin-Goldberg, 2012). Such pedagogical strategy is more effective when they are implemented with the help of technology.

2.2   Project based learning

Reviewing literature and previous studies related to project-based learning has revealed that the term has been in use by many educators and scholars. PBL is a constructivist teaching strategy that enhances students' learning via engaging them in a collaborative process with the aim of solving problems (Vaca Torres & Gómez Rodríguez, 2017). PBL is a comprehensive instructional technique that involves learners in a long-term, collaborative inquiry process focused on real-world challenges and designed around learners' personal interests to enhance their critical thinking and reflection (Grant, 2002; Railsback, 2002). According to Estrada Oliver et al. (2020), PBL is a pedagogical model that can enhance the required skills of the twenty first century through a constructivist education which provides concrete evidence by means of a project.

PBL is a real application of the principles and philosophy of constructivism. It is stated that constructivism suggests that students can construct meaning and learn better from the experience they encounter in life. It calls for practical and hands on learning experience through

engaging students in real-world problems which is the core of PBL (Bell, 2010). According to Cocco (2006), PBL has three constructivist assumptions. These three principles are: learning should be delivered in specific contexts; students should be engaged deeply in their instruction, and they should be engaged in social and collaborative processes to better accomplish their learning goals. PBL formulates a flexible learning atmosphere where learners can demonstrate what they know. Also, it provides students with opportunities to be engaged in a process where they have real life world with the aim of finding solutions (Bell, 2010).

Based on constructivism theory, Larmer (2012) proposed some basic guidelines to make projects effective:

- The project should be based on a real-life situation which exceeds the classroom environment. In other words, the outcomes of the project can be used outside the classroom by ordinary people in the society.
- The project should focus on a problem, issue or topic which is related to the content of the curriculum students learn.
- The project should present a scenario or simulation that is close to that presented in real world.
- The environment where the project is carried out should involve tools, tasks, or processes that of the real world.

In the same sense, Dewi (2016), presented seven features that can be considered the main components of PBL. First, learner centered environment. When adopting PBL, this requires a change in terms of the roles of both the student and the teacher. Second, collaboration. PBL paves the way for learners to practice collaboration as it requires learners to be engaged in group work, collaborative decision-making process, and peer feedback. Third, curriculum content. Projects should be designed in terms of the objectives of the curriculum and its content. Fourth, authentic tasks. Projects should be connected to real world issues that are relevant to students' lives and interests. Fifth, multiple presentation modes. This component gives the students a space to use multiple technologies to be part of their planning, development, or presentation of their projects. Sixth, time management. Students should take the time allocated for completing their projects into account. Last, innovative assessments. Assessing projects should be an ongoing process. It should include assessments by teachers, students, peers, and reflection.

PBL has several advantages. It promotes social learning, communication, negotiation, and collaboration. Moreover, it increases learning responsibility, goal setting, independence, and discipline. In addition, the active learning process involved when implementing PBL takes into consideration the different learning styles and preferences of learners. Through PBL, students discover who they are as learners. Finally, recent research has proved that using PBL is a good tool to involve learners in real-world tasks which in turn deepen their learning (Aksela & Haatainen, 2019; Bell, 2010).

In the same sense, Sumarni (2015), added the following advantages for project based learning:

- PBL increases students' learning motivation. When PBL is successfully implemented, it makes students highly motivated and involved in their learning.
- PBL increases collaboration. During the implementation of PBL, students work in teams, and they interact and develop skills related to collaborative learning. (Yalcin et al., 2009).
- PBL increases the ability to communicate. PBL can enhance learners' communication skill. Through PBL, learners can grasp how to listen to other partners carefully and how to be open to different opinions (Yalcin et al., 2009).
- PBL enhances learners' skills to make use of the available learning sources. Through PBL, students learn how to do research. They can make use of the internet, libraries, field trips and observations.
- PBL creates fun learning. PBL creates fun classroom atmosphere as it gets students out of the routine traditional classroom (Yalcin et al., 2009).
- PBL increases students' attitudes toward learning. According to recent studies, there is a link between PBL and higher levels of positive attitude towards learning in general (Baş, 2011).
- PBL reduces anxiety among learners during the learning process. Anxiety levels of learners can be lowered by involving them in PBL (Erdem, 2012).
- PBL increases students' creativity and problem-solving skills.

PBL has been highly recommended by many scholars and educators to be applied in the classroom to enhance students' Twenty-First Century skills. Syarifah and Emiliasari (2019) stated that PBL does not only help learners to enhance their own language skills but also

enhances other skills such as creative and critical thinking. Sultan and Javaid (2018) added that learners who have been instructed through PBL performed better in the classroom and had higher motivation and subject awareness levels compared to those who were instructed conventionally. In addition to encouraging students to work on projects based on their own personal interests and needs, PBL aims to develop students' critical thinking, collaboration and problem solving (Kapp, 2009).

In the same line of thought, Sahin and Top did a study to examine the effectiveness of PBL and STEM education in the twenty first century skills. The findings of this qualitative study revealed that PBL positively impacted some of the twenty first century skills such as communication, and collaboration. Also, the study revealed that PBL developed learners' ownership regarding their learning.

At the language level, project-based learning has several advantages on English language. First, it improves language skills. This is because PBL engages students in authentic tasks that require them to communicate purposefully. Therefore, they have the chance to use language naturally. Second, PBL develops students' English language for real- life situations by assisting them in becoming more proficient in using English and encouraging their autonomy and integrated skill practice.(Fragoulis & Tsiplakides, 2009; Kavlu, 2017). Also, PBL has been described as "simultaneous acquisition of language, contents and skill(Beckett & Slater, 2005).

Integrating PBL with second or foreign language learning instruction has recently become a necessity. Many scholar and educators such as(Solomon, 2003; Sultan & Javaid, 2018) has used PBL with outcomes related to second and foreign language learning. When applying PBL, teachers usually encourage students to be engaged in asking question processes, interacting and communicating with one another, experimenting their thoughts and ideas, analyzing information and drawing conclusions.   (Li et al., 2015).

According to Foulger and Jimenez-Silva (2007), PBL depends more on a complex set of communication abilities which ranges from those abilities that focus on receptive skills represented in listening and reading to productive skills represented in speaking and writing to processing skills represented in critical and creative thinking. Such processes are carried out in real or virtual situations. Also, PBL helps those students who study English as a second or foreign language to

enhance their school skills, feel connected to the learning process and classroom community and motivating them to learn better.

As for the teacher's role when implementing PBL, teachers are required to support and guide students, set the plan for the classroom and attempt to end the project successfully. PBL requires teachers to have enthusiasm towards implementing the project, and to have several skills that make them up to date and not to think of themselves as being the only source of information in the classroom. The teacher should act as a facilitator, consultant, and advisor. The teacher should forget the idea of leadership and move to the idea of partnership (Markham et al., 2003).

In fact, it may be a challenge for teachers implement PBL in second or foreign language classrooms because they find it difficult for them to structure, design and employ the systematic method of project-based learning. Also, it can be challenging for students as well to participate in such approach that requires them communicate in the second or foreign language (Newell, 2003). In order to overcome such challenges and concerns ,a practical and well defined framework designed for second or foreign language contexts known as the 10 Cs of project- based learning TESOL Curriculum has been designed as it can help teachers structure and clarify the different stages and processes of project- based learning as well as it can help students understand the process and their roles well (Greenier, 2020).

According to Greenier (2020), the 10 Cs of project-based learning framework consists of ten elements. The first stage is **coaching**. In this stage, students are familiarized with the language focus of the unit that will be incorporated in the project. The second stage is **concept generation**. In this stage, students are asked to individually brainstorm ideas related to the project. According to recent research, individual brainstorming is more effective than group brainstorming as it generates original, and a large number of ideas compared to the group brainstorming. For each project, the teacher should determine a bare minimum of ideas and thoughts related to the project from each student individually (Thompson, 2013). At home, students email their lists of ideas to the teacher to prepare them to the next class. Once the teacher receives the students' lists, he or she divides the students into groups for the project and creates an anonymous list of each group's thoughts. The teacher then gives each student a copy of their group's anonymous list

and gives them enough time to determine which ideas they like most. (Greenier, 2020).

The third stage is **confrontation**. In this stage, the teacher informs the students with their project teams and allow them to team up. Each team records their conversations where they exchange their ideas and thoughts to come up with a common understanding and agreement up on their discussion. Discussion and debates enable students to develop their critical and creative thinking and are most welcomed in this stage as they help students to renegotiate goals to better create original solutions for their projects (Kurtzberg & Amabile, 2001).

The fourth stage is **comprehension**. In this stage, students start listening to their previously recorded talks that were done in the previous stage. This helps students to have a clear vision about the goal of their project and the procedures of implementing it. When the students get back to class, they begin the fifth stage which is **creation**. In this stage, the project is constructed. Creating something paves the way for learners to relate the learning objectives to something physical which helps students to be involved deeply in their instructional process (Greenier, 2020).

The sixth stage is **critique**. In this stage, students are supposed to criticize and pose questions on their projects. In this stage, students practice self-assessment and accept the criticism of others. Students should prepare their proposed changes based on their self-assessment (Thompson, 2013). The seventh stage is the **change**. In this stage, students debate the proposed changes of the previous critique stage. They attempt to come up with an agreement about it (Greenier, 2020).

The eighth stage is the **culmination.** In this stage, students are required to present or perform their project. This is a good chance for each team to demonstrate their hard work and understand and appreciate the projects implemented by their peer groups (Robinson & Aronica, 2015). The ninth stage is **the collaborative reflection** where the entire class is involved in self and peer assessments. The main aim of this stage is to encourage learners to pose questions to one another on the projects and their processes that give both learners and teachers a detailed overview about the learning process. Also, in this stage, students are given the chance to practice reflection and relate what they have learned to similar situations in the future (Cummings, 2000).

The last stage is **composition**. In this stage, students write about their experience. They mainly address how can they relate what they have learned to their own life or they can write about their favorite step of the project or write about a talk they had with their peers in the groups that helped to enhance the project (Greenier, 2020; Hetland et al., 2015).

To better implement project-based learning, using blended learning is highly recommended. Blended learning has become an essential approach in language learning. The term "blended learning" is defined as an approach that combines both face to face learning and teaching mediated by technology. In blended learning, regular learning is supported by appropriate learning technology tools. The outcome of using technology along with the conventional classroom setting is the creation of an innovative learning environment which help teachers better introduce and organize their content (Ata, 2016).

Reviewing literature and previous studies related to blended learning revealed that there is a variation in the definitions of blended learning (Whitelock & Jelfs, 2003) yet there is a common agreement between educators and scholars that blended learning includes a combination of face-to-face learning and using technology. (Kerres & Witt, 2003). For Stacey and Gerbic (2007), combining any instructional method that include virtual resources and face -to-face sessions has been given the term" blended learning".

Many researchers agreed that blended learning can be represented as a continuum, with the learning process falling anywhere between a fully face-to-face course in which the teacher provides all teaching and learning processes in traditional classroom settings and a fully online course in which all learning processes are delivered online. (Helms, 2014).

A big number of studies have revealed that blended learning is beneficial to students' learning. Overall, these studies indicated that students obtain higher grades when receiving learning through blended formats compared to the face to face or fully online learning (Dziuban, 2001; Martyn, 2003; Vaughan, 2007). In the same line, Delfino et al. (2007), revealed that integrating both virtual and face to face learning can enhance feeling of socialization and togetherness among students which in turn enhances their learning and achieves its goals.

Moreover, many researchers and scholars have presented some recommendations for structuring blended learning. They recommended

assigning the first session to be face to face to familiarize students with the online learning tools and at least one more face to face session in the middle and at the end of the program. The other sessions may be assigned to be online using any of the online tools (Garrison & Kanuka, 2004; Michinov & Michinov, 2007) .

Therefore, using technology in general and blended learning in particular may add more to PBL. Using online tools such as WebQuests, blogs, Zoom, Microsoft teams, forums and online platforms along with face-to-face teaching may help teachers and instructors enrich PBL environment.

Based on the so many benefits and advantages for project based learning and blended learning, the researcher adopted them in the present research to improve students' 4Cs skills. In other words, the present study attempted to use some assisted online learning applications along with conventional classroom setting to implement project-based learning in order to improve students' 4Cs skills.

3. Method

This part of the research sheds light on the research methodology that has been followed to investigate the effect of a program based on blended project-based learning on developing the 4 Cs skills among first year secondary stage students.

3.1. Research design

The research design followed in this study is the one-group pretest-posttest quasi experimental design. This design was selected because the instruments of the study aimed at examining the effect of a proposed blended project-based learning program on developing the 4Cs skills for the same students before and after the implementation of the program. In addition, the program is a proposed one which means that no control group is required as there is no secondary school subject or course that targets the 4 Cs skill.

3.2 Participants of the study

The participants of the study were 30 female first year secondary school students at Hassan Abu Bakr Distinguished Governmental Language School in El-Qanater Elkhairya Educational Administration in Qualybia Governorate during the second semester of the academic year 2020-2021. All of them had been studying English for at least nine years in formal primary and preparatory schools. The 30 students represented a

full class that was randomly selected from a number of six classes that formulate the total number of classes at the secondary stage in the school.

3.3 Instruments of the study

The present study utilized the following main instruments:

3.3.1 A list of critical thinking skills

This list was designed to identify the most important critical thinking skills for first year secondary school students. It was designed and developed after reviewing the literature and the studies related to critical thinking skills as one of the four Cs skills of the 21st century skills and the teacher's book for first year secondary stage students. The researcher made use of this to develop a pre-post critical thinking test.

The initial form of the list included five critical thinking sub skills. This list was then presented to a panel of jury members in the field of curriculum and instruction and EFL methods of teaching (See Appendix A). They were asked to determine the appropriateness of the suggested critical thinking skills to first year secondary school students (See Appendix B). Based on the modifications of the panel of jury members, three critical thinking skills were chosen and used in the study. The critical thinking skills selected by the study according to their high percentages were analysis, inference and evaluation.

3.3. 2 A list of creative thinking skills

This list was designed to identify the most important creative thinking skills for first year secondary school students. It was designed and developed after reviewing the literature and the studies related to creative thinking skills as one of the four Cs skills of the 21st century skills and the teacher's book for first year secondary school stage students. The researcher made use of this list to develop a pre-post creative thinking test.

The initial form of the list included four creative thinking sub skills. This list was then presented to a panel of jury members in the field of curriculum and instruction and EFL methods of teaching. They were asked to determine the appropriateness of the suggested creative thinking skills to first year secondary school students (See Appendix C). Based on the modifications of the panel of jury members, few modifications were made to the creative thinking skills in terms of the phrasing and two sub skills were selected. The creative thinking skills selected by the study according to their high percentages were flexibility, and fluency.

3.3.3 A list of communication skills

This list was designed to identify the most important communication skills for first year secondary school students. It was designed and developed after reviewing the literature and the studies related to communication skills as one of the four Cs skills of the 21st century skills and the teacher's book for first year secondary stage students. The researcher made use of this list to develop the observation checklist designed to assess students' communication skills.

The initial form of the list included five communication skills. This list was then presented to a panel of jury members in the field of curriculum and instruction and EFL methods of teaching. They were asked to determine the appropriateness of the suggested communication skills to first year secondary school students (See Appendix D). Based on the modifications of the panel of jury members, four communication skills were chosen and used in the study.

3.3.4 A list of collaboration skills

This list was designed to identify the most important collaboration skills for first year secondary school students. It was designed and developed after reviewing the literature and the studies related to collaboration skills as one of the four Cs skills of the 21st century skills and the teacher's book for first year secondary stage students. The researcher made use of this list to develop the observation checklist designed to assess students' collaboration skills.

The initial form of the list included five collaboration skills. This list was then presented to a panel of jury members in the field of curriculum and instruction and EFL methods of teaching. They were asked to determine the appropriateness of the suggested collaboration skills to first year secondary school students (See Appendix E). Based on the modifications of the panel of jury members, three collaboration skills were chosen and used in the study.

3.3.5 The pre- post critical thinking test

The purpose of the pre-post critical thinking test was to measure the participants' critical thinking skills as one of the four Cs skills. A critical thinking test, with six questions that target the three pre-determined critical thinking skills was modified by the researcher in light of a table of specifications based on the specified three critical thinking skills determined earlier. Each critical thinking skill was assessed by two objective questions that required only one correct answer. Each question

worth one point. The first two questions measured students' analysis. Questions 3 and 4 measured inferences. Questions 5 and 6 measured evaluation.

To measure the content validity of the test, the initial version of the test was given to a number of curriculum and EFL specialists to evaluate it in terms of content appropriateness, number of items and suitability of the test to first year secondary school students' level. They accepted all the items except for few notes on some difficult wording in the questions See Appendix (F).

Piloting the test

To pilot the test, it has administered to a group of 35 first year secondary school students prior to the actual treatment. Those 35 students did not participate in the research. The purpose of the piloting was to:

- Measure the validity and reliability of the test.
- Investigate clarity of the questions.
- Check the suitability of the language level to the participants.
- Determine the appropriate time needed to answer the test.

No problems were reported regarding the suitability of the language level of the questions to first year secondary school students. As for the appropriate time of the critical thinking test, the researcher calculated the mean time taken by each student to complete the test, then the mean time for students participating in piloting the test was calculated and was found to be 24 minutes.

Validity of internal consistency of the pre-post critical thinking test

To measure the internal consistency of the test, the correlation coefficient between the score of each individual item and the overall test score was calculated and results of the correlation coefficient were as follows:

Table (1)

Correlation coefficients between the score of each individual item and the overall test score

Test dimensions	Items	Correlation coefficient
Critical thinking	1	٠.٦٤**
	2	٠.٦٩**
	3	٠.٥٧**
	4	٠.٦٢**
	5	٠.٦٨**
	6	٠.٦٤**

** significant at 0.01 level, where n = 35, and it is significant at 0.01 when the correlation coefficient ≥ 0.43

It is clear from the previous table that all items are statistically significantly related to the total score, which indicates the validity of the internal consistency of the test items.

Reliability of the pre-post critical thinking test

In order to establish the test reliability, the following measures were used:

- Cronbach's Alpha: Alpha coefficient was calculated, and its value was (0.89) and it is a high value which generally refers that the critical thinking test was consistent and reliable.
- Split- half reliability (Spearman-Brown Coefficient): The correlation coefficient was calculated between the two halves of the critical thinking test and its value was (0.74). Meantime, the value of the correlation coefficient after correcting the effect of the split using Spearman- Brown was (0.843) which refers that the critical thinking test is consistent and reliable as a measurement instrument.

Scoring the test

The total score of the test was 6. It was assigned as follows: one score for each correct answer, zero for incorrect or left questions. For test specification, see Appendix (F).

3.3.6 The pre-post creative thinking test

The purpose of the pre-post creative thinking test was to measure the participants' creative thinking skills as one of the four Cs skills. A creative thinking test, with four questions that target the two pre-determined creative thinking skills was modified by the researcher in light of a table of specifications based on the specified two critical thinking skills determined earlier. Each creative thinking skill was assessed by two open ended questions that elicit students' responses.

To measure the content validity of the test, the initial version of the test was given to a number of curriculum and EFL specialists to evaluate it in terms of content appropriateness, number of items and suitability of the test to first year secondary school students' level. They accepted all the items except for few notes on some difficult wording in the questions See Appendix (G).

 Piloting the test

To pilot the test, it is administered to a group of 35 first year secondary school students prior to the actual treatment. Those 35 students did not participate in the research. The purpose of the piloting was to:

- Measure the validity and reliability of the test.
- Investigate clarity of the questions.
- Check the suitability of the language level to the participants.
- Determine the appropriate time needed to answer the test.

No problems were reported regarding the suitability of the language level of the questions to first year secondary school students. As for the appropriate time of the critical thinking test, the researcher calculated the mean time taken by each student to complete the test, then the mean time for students participating in piloting the test was calculated and was found to be 16 minutes.

 Validity of internal consistency of the pre-post creative thinking test

To measure the internal consistency of the creative thinking test, the correlation coefficient between the score of each individual item and the overall test score was calculated and results of the correlation coefficient were as follows:

Table (2)

Correlation coefficients between the score of each individual item and the overall test score

Test dimensions	Items	Correlation coefficient
Creative thinking	1	**٠.٦٧**
	2	**٠.٥٥**
	3	**٠.٦٧**
	4	**٠.٦١**

** significant at 0.01 level, where n = 35, and it is significant at 0.01 when the correlation coefficient ≥ 0.43

It is clear from the previous table that all items are statistically significantly related to the total score, which indicates the validity of the internal consistency of the test items.

 Reliability of the creative thinking test

In order to establish the test reliability, the following measures were used:

- Cronbach's Alpha: Alpha coefficient was calculated, and its value was (0.88) and it is a high value which generally refers that the thinking test was consistent and reliable.

- Split- half reliability (Spearman-Brown Coefficient): The correlation coefficient was calculated between the two halves of the critical thinking test and its value was (0.74). Meantime, the value of the correlation coefficient after correcting the effect of the split using Spearman- Brown was (0.840) which refers that the critical thinking test is consistent and reliable as a measurement instrument.

Scoring the test

Correcting the creative thinking test was as follows: For fluency, each response is calculated and given one point. For flexibility, the number of different categories is calculated. Each different category of students' responses is given one point. To determine the full mark of the creative thinking test, the program was piloted on a group of 15 students and their fluency and flexibility skills were tested using the same pre-post creative thinking test and the highest score in each skill was considered to be the full mark of the test when applied to the study group.

3.3.7 An observation checklist for communication skills

This observation checklist was designed to assess the pre-post communication assessment designed by the researcher. Furthermore, the observation checklist was used during the program to assess students' communication skills. It was designed and developed after reviewing the literature and the studies related to communication skills as one of the four Cs skills of the 21st century skills.

The initial form of the observation checklist included four communication sub skills and a number of their performance indicators. These four skills and their performance indicators were rated according to a 3-point scale: not achieved, to some extent achieved, and achieved. Thus, students' scores ranged from 1 (indicating lowest performance) to 3 (indicating highest performance). It was then presented to a panel of jury members in the field of curriculum and instruction and EFL methods of teaching. They were asked to determine the appropriateness of the suggested communication skills and their performance indicators to first year secondary school students (See Appendix H). Based on the modifications of the panel of jury members, four communication sub skills and a number of performance indicators were chosen and given a high rate.

Piloting the communication observation checklist

The observation checklist for communication skills was administered on a piloting sample (20) first year secondary school students in three subsequent days for the following reasons:

Validity of internal consistency

To measure the internal consistency of the observation checklist for communication, the correlation coefficient between the score of each individual item and the overall test score was calculated and results of the correlation coefficient were as follows:

Table (3)

Correlation coefficients between each individual item and the overall score of the observation checklist

Dimension	Items	Correlation coefficient
Communication skills	1	**٠.٦٧
	2	**٠.٦٩
	3	**٠.٦٦
	4	**٠.٦٩
	5	**٠.٦٣
	6	**٠.٦٢
	7	** ٠.٦٩
	8	** ٠.٦٩
	9	**0.67
	10	**٠,٦٣

** significant at 0.01 level, where n = 20, and it is significant at 0.01 when the correlation coefficient ≥ 0.57

It is clear from the previous table that all items are statistically significantly related to the total score, which indicates the validity of the internal consistency of the observation checklist for communication.

The reliability of the communication skill observation checklist

In order to measure the reliability of the observation checklist for communication skills, the inter-rater reliability method was used as the observation checklist was administered by another rater in addition to the researcher and the agreement percentage was calculated between the two raters using Cooper equation and it was found to be 96% which is a good percentage and indicates that the observation checklist was reliable.

3.3.8 An observation checklist for collaboration skills

This observation checklist was designed to assess the pre-post collaboration assessment designed by the researcher. Furthermore, the observation checklist was used during the program to assess students'

collaboration skills. It was designed and developed after reviewing the literature and the studies related to collaboration skills as one of the four Cs skills of the 21st century skills.

The initial form of the observation checklist included five collaboration sub skills and a number of their performance indicators. These five skills and their performance indicators were rated according to a 3-point scale: not achieved, to some extent, and achieved. Thus, students' scores ranged from 1 (indicating lowest performance) to 3 (indicating highest performance). It was then presented to a panel of jury members in the field of curriculum and instruction and EFL methods of teaching. They were asked to determine the appropriateness of the suggested collaboration skills and their performance indicators to first year secondary school students (See Appendix I). Based on the modifications of the panel of jury members, three collaboration sub skills and a number of eight performance indicators were chosen and given a high rate.

Piloting the collaboration observation checklist

The observation checklist for communication skills was administered on a piloting sample (20) first year secondary school students in three subsequent days for the following reasons:

Validity of internal consistency

To measure the internal consistency of the observation checklist for collaboration skills, the correlation coefficient between the score of each individual item and the overall test score was calculated and results of the correlation coefficient were as follows

Table (4)

The values of correlation coefficients between each individual item and the overall score of the observation checklist

Dimension	Items	Correlation coefficient
Collaboration skills	1	٠.٦٠**
	2	٠.٦٥**
	3	٠.٦٣**
	4	٠.٥٩**
	5	٠.٦٤**
	6	٠.٦٢**
	7	٠.٦٢ **
	8	٠.٥٩ **

** significant at 0.01 level, where n = 20, and it is significant at 0.01 when the correlation coefficient ≥ 0.57

It is clear from the previous table that all items are statistically significantly related to the total score, which indicates the validity of the internal consistency of the observation checklist for communication.

The reliability of the collaboration skill observation checklist

In order to measure the reliability of the observation checklist for collaboration skills, the inter-rater reliability method was used as the observation checklist was administered by another rater in addition to the researcher and the agreement percentage was calculated between the two raters using Cooper equation and it was found to be 94% which is a good percentage and indicates that the observation checklist was reliable.

3.3.9 The program

The project-based learning program was developed by the researcher to enhance first year secondary school stage students' 4Cs skills, mainly, critical thinking, creative thinking, communication, and collaboration skills within a blended learning environment.

The aim of the program

This program aimed at developing first year secondary school students '4 Cs skills, namely, critical reading, creative thinking, communication and collaboration skills at Hassan Abu Bakr Distinguished Governmental Language School in El-Qanater Elkhairya Educational Administration in Qualybia Governorate.

 The objectives of the program

The program intended to develop specific objectives related to the four Cs skills (critical thinking, creative thinking, communication, and collaboration skills) as follows:

By the end of this program, students would be able to:

1- Analyze information, ideas, thoughts, and points of views. (Analysis)
2- Evaluate evidence, and claims. (Evaluation)
3- Make inferences to draw conclusions based on the best analysis. (Inference)
4- Produce a wide variety of ideas that show different possibilities and solutions.
5- Generate a big number of ideas or alternate solution
6- Listen carefully to figure out meaning.
7- Present thoughts and ideas effectively using oral language.
8- Make use of non-verbal language to deliver thoughts and ideas.
9- Express one's opinion, in speaking, in a convincing manner.

10- Participate effectively with diverse teams.

11- Show flexibility and willingness to compromise to achieve a common goal.

12- value the individual contributions made by each team member.

Content of the program

The content of the program is project based one implemented in a blended learning environment where students engaged in face to face and online sessions. The face-to-face sessions were carried out at regular classroom settings at Hassan Abu Bakr Distinguished Governmental Language School in El-Qanater Elkhairya Educational Administration in Qualybia Governorate and the online sessions were carried out through zoom. The content of the program was adapted from first year general secondary school textbook (New Hello! Year one Term 2) along with some other adapted materials related to project-based learning and the targeted 4 Cs skills. The content of the program employed the use of project-based learning in a blended learning environment (See Appendix J).

Description of the program

The program consisted of four units with a total of 14 lessons. The first unit consisted of two lesson and were devoted to the introduction of the program and orientation sessions (lessons) about project based learning and blended learning (with great focus on zoom). Unit 2 was about Health and Safety and was adapted from the school textbook (New Hello! Year one Term 2). This unit consisted of four lessons. Unit 3 was Robots and was adapted from the school textbook (New Hello! Year one Term 2). This unit consisted of four lessons. Unit 4 was a good education. and was adapted from the school textbook (New Hello! Year one Term 2). This unit consisted of four lessons.

The implementation of the program

Before introducing the blended project-based learning program to the study group, the researcher with the help of one of the English language school teachers at the school applied the instruments of the research as on week 2 of the second semester of the academic year 2020-2021, the researcher administered the critical thinking test, the creative thinking test, the observation checklist for communication skills, and the observation checklist for the collaboration skills on the study group who were randomly selected. Starting from the third week, the study group

received the blended project-based learning program both face to face and online through an English teacher from the school as follows:

-**Program orientation procedures**
- The instructor explained the aims and objectives of the blended project-based learning program to the study group.
- The instructor oriented students on both blended learning and its tools which are used in this program and project based learning. In this context, the researcher trained the study group on using zoom as well as project-based learning.
- The researcher discussed the importance of developing the 21st century skills in general and the 4Cs skills (critical thinking, creative thinking, communication, and collaboration skills)

Delivering lesson procedures

Each project driven lesson was typically following the following steps that represented the core of PBL model used in this research. Steps 1,2,3,4 of the PBL model were done online through a video conferencing application (zoom) and the other steps were done face to face in regular classroom settings.

Step 1: coaching

In this stage, the instructor introduces the language focus of the lesson that will be tackled by the project.

Step 2: concept generation

In this stage, the instructor asks students to individually brainstorm ideas and thoughts related to the project they are supposed to do in the lesson. Once, students are done with their individual brainstorming, they email their lists of ideas to the instructor who, then, divides students into groups and give each group a copy of their group list of ideas and thoughts they came up with in the individual brainstorming process.

Step 3: confrontation

In this stage, the instructor divides students into teams, and give each group a copy of their group list of ideas and thoughts they came up with in previous stage which reflect the project they are supposed to do together. The instructor asks each team to record their conversations where they exchange ideas related to the project to reach a common understanding.

Step 4: comprehension

In this stage, students listen to their talks they recorded in the previous stage and think deeply about the goal of the project, their perspective towards it, the steps of implementing it.

Step 5: creation

In this stage, the project is created. Creating something allows students to apply their own learning and relate it to something concrete.

Step 6: critique

In this stage, students provide critical judgements and ask questions about their project with the aim of practicing self-assessment.

Step 7: change

In this stage, students talk together about the proposed changes they have about their project. They try to come up with an agreement about the changes that might be added to their project and once they have an agreement about the that, they modify and change their projects.

Step 8: culmination

In this stage, each team is asked to present or perform their project.

Step 9: the collaborative reflection

All the teams in the class are asked to assess their own work and the work of other teams. The main aim of this stage is to encourage learners to ask one another questions related to the projects and its steps which gives both learners and teachers a detailed overview about the learning process.

Step 10: composition

In this stage, as homework, students are asked to write about how they relate what they have benefited from their projects to their own lives, or they can write about their favorite part of the project.

Duration of the program

The program lasted for about ninth weeks in the second semester of the academic year 2020-2021. The total number of the instructional sessions was 24 sessions divided between face to face and online sessions.

Assessment of the program

In order to measure the impact of the blended project-based learning program on developing first year secondary school students' 4 Cs skills, the researcher administered the pre-post 4 Cs assessments on the study group.

4.Findings of the study

The quantitative results of the study are presented by relating them to the study hypotheses.

Hypothesis one

The first hypothesis of the present study is "There would be a statistically significant difference between the mean scores of the study participants on the pre and post applications of the overall critical thinking test and on each skill separately in favor of the post application. In order to verify this hypothesis, T test for paired samples (dependent samples) was used to reveal the significant differences between the pre and post applications of the critical thinking test as shown in the following table:

Table (5)

The results of T test for the significant differences between the mean scores of the study group on the pre and post applications of the overall critical thinking test and in each sub skill separately where (N= 30) and (degrees of freedom= 29)

Critical thinking skills	Mean		Std. Deviation		T- test Value	Sig.	Effect size (η^2)
	pre	post	Pre	post			
Analysis	0.53	1.77	0.63	0.43	9.950	0.000	0.77
Inference	0.5	1.47	0.63	0.57	7.370	0.000	0.65
Evaluation	0.43	1.07	0.57	0.52	7.077	0.000	0.63
Overall critical thinking score	1.47	4.3	1.04	0.99	12.300	0.000	0.84

The previous table shows that the arithmetic mean for students' scores on the post application of the critical thinking test, for both overall critical thinking skills and each sub skill separately, is higher than that of the pre application which indicates that students' level of critical thinking skills was developed after receiving the proposed program. Also, the standard deviation for students' scores on the post application of the

critical thinking test, for both overall critical thinking skills and each sub skill separately is smaller than that of the pre application which indicates that students' level of critical thinking skills was close after receiving the proposed program. Moreover, the significant level for critical thinking skills as overall skills and on each sub skill separately is less than (0.01) which indicates there is a statistically significant difference between the pre and post applications of the critical thinking test for both overall critical thinking skills and each sub skill separately at (0.01) level in favor of the post application; hence, the first hypothesis is verified.

In order to calculate the effect size, Eta-squared was used as follows

Effect size $(\eta^2) = t^2 / (t^2 + df)$

(η^2) is interpreted as shown below:

Table (6)
Eta- squared and effect size values

If	$\cdot.\cdot١\cdot > (\eta^2)$	Effect size is weak
If	$\cdot.\cdot٥٩ > (\eta^2) \geq \cdot.\cdot١\cdot$	Effect size is small
If	$\cdot.١٣٨ > (\eta^2) \geq \cdot.\cdot٥٩$	Effect size is medium
If	$\cdot.٢٣٢ > (\eta^2) \geq \cdot.١٣٨$	Effect size is large
If	$(\eta^2) \geq \cdot.٢٣٢$	Effect size is very large

The previous table shows that the effect size value calculated by Eta squared for critical thinking test as an overall skill and its sub skills is bigger than (0.232) which means that the effect size is very large; therefore, it can be concluded that the proposed blended project-based learning had a very large effect on developing students' overall critical thinking skills and each sub skill separately for the study group.

Hypothesis two

The second hypothesis of the present study is "There would be a statistically significant difference between the mean scores of the study participants on the pre and post applications of the overall creative thinking test and on each skill separately in favor of the post application. In order to verify this hypothesis, T test for paired samples (dependent samples) was used to reveal the significant differences between the pre and post applications of the creative thinking test as shown in the following table:

Table (7)

The results of T test for the significant differences between the mean scores of the study group on the pre and post applications of the overall creative thinking test and in each sub skill separately where (N= 30) and (degrees of freedom= 29)

Creative thinking skills	Mean		Std. Deviation		T- test value	Sig.	Effect size (η^2)
	Pre	Post	pre	post			
Fluency	2.7	5.89	0.6	1.27	14.018	0.000	0.87
Flexibility	1.97	3.97	0.61	0.5	14.840	0.000	0.88
Overall creative thinking score	4.67	9.73	0.84	1.38	20.874	0.000	0.94

The previous table shows that the arithmetic mean for students' scores on the post application of the creative thinking test, for both overall creative thinking skills and each sub skill separately, is higher than that of the pre application which indicates that students' level of creative thinking skills was developed after receiving the proposed program. Also, the standard deviation for students' scores on the post application of the creative thinking test, for both overall creative thinking skills and each sub skill separately is smaller than that of the pre application which indicates that students' level of creative thinking skills was close after receiving the proposed program. Moreover, the significant level for creative thinking skills as overall skills and on each sub skill separately is less than (0.01) which indicates there is a statistically significant difference between the pre and post applications of the creative thinking test for both overall creative thinking skills and each sub skill separately at (0.01) level in favor of the post application; hence, the second hypothesis is verified.

Moreover, the effect size value calculated by Eta squared for creative thinking test as an overall skill and its sub skills is bigger than (0.232) which means that the effect size is very large; therefore, it can be concluded that the proposed blended project-based learning had a very large effect on developing students' overall critical creative thinking skills and each sub skill separately for the study group.

Hypothesis Three

The third hypothesis of the present study is "there would be a statistically significant difference between the mean scores of the study participants on the pre and post application of the overall observation checklist for communication skills and on each skill separately in favor of the post application." In order to verify this hypothesis, T test for paired samples (dependent samples) was used to reveal the significant differences between the pre and post applications of the observation checklist for communication skills as shown in the following table:

Table (8)

The results of T test for the significant differences between the mean scores of the study group on the pre and post applications of the overall observation checklist for communication skills and in each sub skill separately where (N= 30) and (degrees of freedom= 29)

Communication skills	Mean		Std. Deviation		T- test Value	sig	Effect size (η^2)
	Pre	Post	pre	post			
1- Listen carefully to figure out meaning.	3.6	7.8	1.22	1.86	12.339	0.000	0.84
2- Present thoughts and ideas effectively using oral language.	2.47	5.07	0.86	1.14	11.948	0.000	0.83
3- Make use of non-verbal language to deliver thoughts and ideas.	4.1	7.00	1.47	1.64	7.918	0.000	0.68
4- Expressing one's opinion, in speaking, in a convincing manner.	2.33	4.8	0.76	1.00	10.790	0.000	0.8
Overall communication skills score	12.5	24.67	2.46	2.71	22.873	0.000	0.95

The previous table shows that the arithmetic mean for students' scores on the post application of the communication skill observation checklist, for both overall communication skills and each sub skill separately, is higher than that of the pre application which indicates that students' level of communication skills was developed after receiving the proposed program. Also, the standard deviation for students' scores on the post application of the observation checklist for communication skills, for both overall communication skills and each sub skill separately is smaller than that of the pre application which indicates that students' level of communication skills was close after receiving the proposed program. Moreover, the significant level for communication skills as overall skills and on each sub skill separately is less than (0.01) which indicates there is a statistically significant difference between the pre and post applications of the communication skill observation checklist for both overall communication skills and each sub skill separately at (0.01) level in favor of the post application; hence, the third hypothesis is verified.

Moreover, the effect size value calculated by Eta squared for communication skill as an overall skill and its sub skills separately is bigger than (0.232) which means that the effect size is very large; therefore, it can be concluded that the proposed blended project-based learning had a very large effect on developing students' overall communication skills and each sub skill separately for the study group.

Hypothesis four

The fourth hypothesis of the present study is "there would be a statistically significant difference between the mean scores of the study participants on the pre and post application of the overall observation checklist for collaboration skills and on each skill separately in favor of the post application." In order to verify this hypothesis, T test for paired samples (dependent samples) was used to reveal the significant differences between the pre and post applications of the observation checklist for collaboration skills as shown in the following table:

Table (9)

The results of T test for the significant differences between the mean scores of the study group on the pre and post applications of the overall observation checklist for collaboration skills and in each sub skill separately where (N= 30) and (degrees of freedom= 29)

Collaboration skills	Mean		Std. Deviation		T- test Value	sig	Effect size (η^2)
	pre	post	pre	post			
1- Participate effectively with diverse teams.	3.7	8.2	1.7	1.35	12.042	0.000	0.83
2- Show flexibility and willingness to compromise to achieve a common goal.	3.6	6.4	1.22	1.52	9.815	0.000	0.83
3- Value the individual contributions made by each team member.	2.33	4.07	0.76	0.98	9.355	0.000	0.75
Overall collaboration skill score	9.63	18.67	3	2.37	18.795	0.000	0.92

The previous table shows that the arithmetic mean for students' scores on the post application of the collaboration skill observation checklist, for both overall collaboration skills and each sub skill separately, is higher than that of the pre application which indicates that students' level of collaboration skills was developed after receiving the proposed program. Also, the standard deviation for students' scores on the post application of the observation checklist for collaboration skills, for both overall collaboration skills and each sub skill separately is smaller than that of the pre application which indicates that students' level of collaboration skills was close after receiving the proposed program. Moreover, the significant level for collaboration skills as

overall skills and on each sub skill separately is less than (0.01) which indicates there is a statistically significant difference between the pre and post applications of the collaboration skill observation checklist for both overall collaboration skills and each sub skill separately at (0.01) level in favor of the post application; hence, the third hypothesis is verified.

Moreover, the effect size value calculated by Eta squared for collaboration skill as an overall skill and its sub skills separately is bigger than (0.232) which means that the effect size is very large; therefore, it can be concluded that the proposed blended project-based learning had a very large effect on developing students' overall collaboration skills and each sub skill separately for the study group.

Measuring the effect of the proposed blended project-based program on developing the 4Cs skills

Although the effect size is very large as shown in the previous tables which indicate the effectiveness of the proposed program in developing first year secondary school students' 4Cs skills, the corrected Ezzat's Gain Ratio was calculated according to the following formulas (Abdelhamid, 2013, p.28):

$$CEG_{ratio} = \frac{M_2 - M_1}{P - M_1} + \frac{M_2 - M_1}{P} + \frac{M_2 - M_1}{M_2}$$

CEG= corrected Ezzat gain ratio

M1= the mean of the pre measurement

M2= the mean of the post measurement

P= the full mark of the test

If CEG ratio is less than 1.5, the program is not effective.

If CEG ratio is between 1.5 and 1.8, the program is moderate in terms of effectiveness.

If CEG ratio is bigger than or equal 1.8, the program is effective.

The following table shows the values of the CEG ratio:

Table (1٠)

The mean scores of the study group on the pre and post applications of the measurement instruments of the 4 Cs skills and the CEO ratio

Skill	Full Mark	Mean scores		Ezat correct Gain Ratio	significance
		Pre M_1	Post M_2		
Critical thinking	6	1.47	4.3	2.50	Effective
Creative thinking	16	4.67	9.73	1.57	Moderate
Communication	30	12.5	24.67	3.38	Effective
Collaboration	24	9.63	18.67	2.70	Effective
the 4Cs Skills	76	28.27	57.37	2.50	Effective

The previous table shows that the CEG ratio for creative thinking for the study group is (1.57) which means that it is between 1.5 and 1.8 and this indicates that the proposed program was moderate in terms of effectiveness in developing creative thinking. On the other hand, the CEG ratio for critical thinking, communication, collaboration, and the overall skills is bigger than 1.8 which means that the proposed blended project-based learning program is effective on developing the 4Cs skills for the study group which answer the main study questions.

5. Discussion

This section sheds light on the interpretation and discussion of the findings presented in the previous section. The findings are interpreted and discussed in light of the study hypotheses.

The main goal of this study was to develop the 4Cs skills (critical thinking, creative thinking, communication, and collaboration) among first year secondary school students at Hassan Abu Bakr Distinguished Governmental Language School through using a proposed blended project- based learning program. The proposed program applied the principles and stages of the 10 Cs project-based learning model in a blended learning environment that combined both face to face and online learning. The results of the study revealed that the blended project-based learning program proved to be statistically and educationally effective on developing the 4Cs skills among first year secondary school students at Hassan Abu Bakr Distinguished Governmental Language School.

Concerning the first hypothesis, the findings revealed that there are statistically significant difference between the mean scores of the study participants on the pre and post applications of the overall critical thinking test and on each skill separately in favor of the post application. Also, results showed variation in the significant differences among the critical thinking skills as follows: analysis (1.77), inference (1.47), and evaluation (1.07). According to the significant differences among the critical thinking skills, analysis is considered the most developed critical thinking skill and evaluation is the least developed skill yet effective as well. These findings indicate that the blended project- based learning program was effective in developing the study group overall critical thinking skills and each critical thinking sub skill separately. Such development may be attributed to the following reasons:

- When implementing the blended project-based learning program, the researcher structured the projects to require students to think critically, reflect on what they were doing. At the same time, the researcher supported, assessed, and provided feedback to the different teams which made them rethink of what they were doing to improve it. such cognitive processes helped to enhance students' critical thinking skills.
- The program set students together to design something and complete a project or build something or research something which in turn helped them develop their critical thinking skills.
- Blended learning as an instructional approach provided the study group with more practice time to practice critical thinking skills and gave the teacher a better chance to follow up students' learning.
- The blended project-based learning program increased students' learning motivation as it made students highly motivated and involved in their learning
- The blended project-based learning program required students at the concept generation stage to individually brainstorm ideas related to the projects they were asked to create or complete and at the confrontation stage it required them to exchange ideas, resolve conflicts among them, and come up with an agreement regarding what they were supposed to do. Also, at the critique stage, students were involved in self-

assessment and self-reflection processes. All these processes could help students to develop their critical thinking skills.

- PBL helped students investigate and explore learning. They were asked to analyze, evaluate, criticize, and make decisions about their projects which helped them develop their critical thinking and creative thinking skills.

- Engaging students in projects turn learners into more responsible and autonomous persons who are mor like investigators and problem solvers because project- based learning asks students to make decisions, negotiate meaning and reach agreements.

- Throughout the implementation of the blended project-based learning program, students were encouraged to ask questions during several stages of the 10 cs project-based learning model which in turn urged pushed students to think critically in order to take a decision at the end. To make a decision, students should analyze, make inference, and evaluate which in turn helped them to enhance their critical thinking skills.

To sum up the first hypothesis, it can be concluded that the blended project-based learning program was statistically significant on developing critical thinking skills among first year secondary stage students. The significant difference was at 0.01 level. These findings are consistent with many other studies that revealed significant impact for project based learning whether face to face or online on critical thinking skills such as (Aránguiz et al., 2020), (Alawi & Soh, 2019; Eldiva & Azizah, 2019).

Concerning the second hypothesis, the findings revealed that there is a statistically significant difference between the mean scores of the study participants on the pre and post applications of the overall creative thinking test and on each skill separately in favor of the post application. Also, results showed variation in the significant differences among the creative thinking skills as follows: fluency (5.89), and flexibility (3.97). According to the significant differences among the creative thinking skills, fluency is considered the most developed creative thinking skill compared to flexibility which is still effective as well. These findings indicate that the blended project- based learning program was effective in developing the study group overall creative thinking skills and each

creative thinking sub skill separately. Such development may be attributed to the following reasons:

- In PBL, students were divided into teams and asked to complete projects which usually required them to solve problems, which in turn, helped them to develop their critical and creative thinking.
- PBL urged learners to find solutions to problems that were required to create or complete their projects; therefore, students were trained to think creatively to find solutions to their problems, issues, and projects.
- The blended project-based learning program turned the learning process from being teacher centered to being learner centered that was totally driven by learning through inquiry to create or complete projects which in turn enhanced students' creative thinking skills.
- The blended project-based learning program provided students with several opportunities through the stages of 10 Cs project-based learning model to suggest, apply and evaluate ideas which in turn helped students to develop their creative thinking skills.

To sum up the second hypothesis, it can be concluded that the blended project-based learning program was statistically significant on developing creative thinking skills among first year secondary stage students. The significant difference was at 0.01 level. These findings are consistent with many other studies that revealed significant impact for project-based learning whether face to face or online on creative thinking skills such as Isabekov and Sadyrova (2018), Rambely et al. (2013), Bell (2010).

Concerning the third hypothesis, the findings revealed that there is a statistically significant difference between the mean scores of the study participants on the pre and post application of the overall observation checklist for communication skills and on each skill separately in favor of the post application. Also, results showed variation in the significant differences among the communication skills as follows: listen carefully to figure out meaning (7.8), present thoughts and ideas effectively using oral language (5. 7), make use of non-verbal language to deliver thoughts and ideas (7.00) and expressing one's opinion, in speaking, in a convincing manner (4.8). These findings indicate that the blended project- based learning program was effective in developing the study group overall communication skills and each communication sub skill separately. Such development may be attributed to the following reasons:

- PBL created a classroom environment where students were encouraged to collaborate and communicate with their peers and the teacher.
- PBL increases the ability to communicate. PBL can enhance learners' communication skill. Through PBL, learners can grasp how to listen to other partners carefully and how to be open to different opinions (Yalcin et al., 2009).
- Project- based learning helps students to play several roles such as that of coordinator, communicator, leader, investigator, and practitioner which turn students into more independent learners.
- The blended project-based learning program provided students with several opportunities to communicate with one another to complete their projects whether face to face or online. They learned to listen to one another, express their opinions and present their thoughts and ideas freely which in turn helped them to enhance their communication skills.
- PBL allows students to learn and show their knowledge through several processes and steps that are followed when adopting PBL as it reduces teacher's talk and give more space for students' talk in the classroom.

To sum up the third hypothesis, it can be concluded that the blended project-based learning program was statistically significant on developing communication skills among first year secondary stage students. The significant difference was at 0.01 level. These findings are consistent with many other studies that revealed significant impact for project-based learning whether face to face or online on communication skills such as Saenab et al. (2018), Kovalyova et al. (2016)

Concerning the fourth hypothesis, the findings revealed that there is a statistically significant difference between the mean scores of the study participants on the pre and post application of the overall observation checklist for collaboration skills and on each skill separately in favor of the post application. Also, results showed variation in the significant differences among the collaboration skills as follows: Participate effectively with diverse teams (8.2), Show flexibility and willingness to compromise to achieve a common goal (6.4), value the individual contributions made by each team member (4.07). These findings indicate that the blended project- based learning program was

effective in developing the study group overall collaboration skills and each collaboration sub skill separately. Such development may be attributed to the following reasons:

- Project-based learning make students eager to learn and quickly motivate them to pursue their own learning as it makes them busy all the time and able to be engaged in a learning by doing process.
- PBL encouraged students to learn from one another through the collaborative learning environment and the interaction processes it created in the classroom between different teams which in turn developed their communication and collaboration skills despite the fact that there were disagreement and conflict between the members of the teams, it was always occurring in a friendly and healthy environment.
- PBL increases students' learning motivation. When PBL is successfully implemented, it makes students highly motivated and involved in their learning.
- PBL increases collaboration. During the implementation of PBL, students work in teams, and they interact and develop skills related to collaborative learning. (Yalcin et al., 2009).
- PBL creates fun learning. PBL creates fun classroom atmosphere as it gets students out of the routine traditional classroom (Yalcin et al., 2009).
- PBL reduces anxiety among learners during the learning process. Anxiety levels of learners can be lowered by involving them in PBL (Erdem, 2012).

To sum up the fourth hypothesis, it can be concluded that the blended project-based learning program was statistically significant on developing collaboration skills among first year secondary stage students. The significant difference was at 0.01 level. These findings are consistent with many other studies that revealed significant impact for project-based learning whether face to face or online on communication skills such as (García, 2016; Papanikolaou & Boubouka, 2010; Yalcin et al., 2009)

To conclude, considering the existing research and the results of the present study, it can be said that the blended project-based learning program can enhance and develop the 4Cs skills.

6. Conclusions, implications, and suggestions for further research
6.1 Conclusion

It can be concluded that the proposed blended project-based learning program is effective in developing the 4 Cs skills (critical thinking, creative thinking, communication, and collaboration) among first year secondary school students. The use of project-based learning in a blended learning environment helps students to become more independent learners, critical thinkers, able to think creatively, collaborate effectively and communicate better whether in a face to face or online. The results of the present study are in consistent with results that proved the positive effect of blended project- based learning program on several aspects and skills of students' learning such as Syarifah (2019), Vaca Torres, & Gómez Rodríguez (2017), Çakiroğlu & Erdemir (2019).

6.2 Implications of the study

Based on the findings of the study, some implications for researchers, scholars, and curriculum designers are recommended as follows:

- It is recommended that teachers who teach English as a foreign or second language should be trained to using project-based learning whether in a face-to-face setting or online setting to be able to enhance students' critical thinking, creative thinking, communication, and collaboration skills.
- EFL curriculum and course designers should take blended project-based learning into account when addressing critical thinking, creative thinking, communication, and collaboration skills.
- It is highly recommended to engage students in creating projects related to the lessons they study to maximize their learning opportunities.

6.3 Suggestions for further research

- At the time, the main focus of the present study was to investigate the effect of a blended project-based learning program on developing the 4Cs skills, further research in required to address other 21st century skills.
- Investigating the effect of a blended project-based learning program on developing the 4Cs skills in other educational stages is suggested.
- Research in the field of training pre and in service teachers on integrating blended project-based learning in their teaching practices is suggested.

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