



مجلة كلية التربية. جامعة طنطا
ISSN (Print):- 1110-1237
ISSN (Online):- 2735-3761
<https://mkmgtjournals.ekb.eg>
المجلد (89) يناير 2023 م



**A Hybrid Collaborative Project- Based Course for
Developing 21st Century Skills, Academic Achievement
and Attitude towards PBL among Gen Z Junior English
Major Student Teachers**

A Research Paper

By

Dr. Samah Rizk R. Al-Refaey

*Associate Professor: Curriculum & Instruction Dept. (TEFL)
Faculty of Education
Mansoura University*

المجلد (89) يناير 2023 م



Abstract

This research aimed at investigating the effect of a hybrid collaborative project- based course on developing 21st century skills, academic achievement, and attitude towards PBL among Gen Z junior English major student teachers at the Faculty of Education, Mansoura University. A random sample of third year English major students (N= 230) were the target participants. They were divided alphabetically to two groups, and randomly assigned to an experimental and a control group. The quasi-experimental approach using a pre- post administration to two independent groups design was adopted for achieving the purpose of the current study. Instruments designed and used were a 21st Century Skills assessment Inventory, an achievement test and an attitude towards PBL scale. T-test for both dependent and independent samples was used for data analysis. Results proved that the experimental group's post levels in 21st Century skills and attitude towards PBL were significantly higher than the control group. The experimental group outperformed the control group in academic achievement, although the differences were not so great. These results confirmed that the use of hybrid collaborative PBL had considerable potential in enhancing 21st century skills, academic achievement, and attitude towards PBL among EFL major junior students.

Keywords: *Hybrid collaborative PBL, EFL, 21st Century skills, attitude, academic achievement, Gen Z, student teachers*



Introduction

The 21st century learning has eventually transformed today's classroom. With more digital natives in the class, both educators and students face a changing classroom that should accommodate different learning paces, styles and needs. The students today are different from those who were born before the 1990s. These Gen Z were born with technology already with them. Therefore, knowing more about the learning attributes that shape effective learning is an essential element for facilitating students' learning needs (Santosa, 2017).

It is indisputable that higher education must adapt to the practices and technological advancements prevalent in the 21st century in the recent increasingly digital world. Additionally, it is a current and important issue for university teachers to change and recognize the fact that Gen Z students need different teaching approaches and methods. The students today are different from those who were born before the 1990s. These Gen Z were born with technology already with them. They have a unique combination of attitudes, beliefs, social norms, and behaviors that will impact education and practice for many years. In today's rich technology environment, having Gen Z students practice inquiry-based learning is important to help them to perceive issues from multiple perspectives, analyze them and construct new knowledge to gain an understanding of the issues (Santosa, 2017; Chicca& Shellenbarger, 2018).

Because of their frequent technology use and extensive screen time, Gen Z students have underdeveloped social and relationship skills and are at increased risk for isolation, insecurity, and mental health issues, such as anxiety and depression. Their technology habits lead them to demonstrate a limited attention span, and they



bore easily when they perceive monotony and repetition. Generation Z desires convenience and immediacy. That's why faculty members need to consider how to develop essential interpersonal communication and collaboration skills which are among the 21st century skills that must be acquired by those students (Chicca& Shellenbarger, 2018).

Since the members of this generation frequently use digital technologies and social networks for social interactions, they rely heavily on the online world. Students that are members of this generation are not accustomed to thinking critically about the information they read online and the sources of those information. The large amount of available information that is being received and processed on a daily basis resulted in students having shorter attention spans and taking longer to complete a single task. Because the members of the Generation Z spend a lot of time by themselves, reading about the current events and communicating with others via digital devices, their process of learning is often intrapersonal. At the beginning of their learning process, the students belonging to this generation want to independently acquire new knowledge via various types of digital technology. Later in the learning process, when they are already familiar with the learning matter, they relax enough to work in groups (Stjepić, Vukšić& Suša Vugec, 2019).

Considering the identified characteristics of Generation Z, these traditional teacher education program approaches and delivery methods are not optimal in meeting the needs of this upcoming generation. If educators continue delivery as done in the past, they may encounter challenges in aligning with the new generation needs (Chicca& Shellenbarger, 2018). In addition, to cope with the demand of new educational paradigm, learning should be held in a way that is based on the 21st century learning skills and principles. The old paradigm of teacher-centered education should be shifted



into student-centered learning (Kember, 2009; Attard, et al., 2010). Unfortunately, there are some educational institutions that do not implement teaching and learning process as the way it is supposed to be. This may be attributed to the lack of the teachers' knowledge about appropriate methods that can be used in teaching and creating an effective teaching and learning process (Astawa, Artini & Nitiasih, 2017).

Teachers' role within the new paradigm has changed from lecturing to becoming only facilitators by monitoring, supervising, and facilitating the learning process. Through this, they tend to give learners more freedom and make them responsible. Similarly, language learners today prefer more flexibility, autonomy, and involvement to make learning enjoyable and effective. They prefer participating in the learning process by being active in a classroom. They prefer to acquire knowledge and skills, keeping in mind their practical application. As a result, it prepares them to meet the challenges of the 21st century (Islam, Halim& Halim, 2022).

However, the great knowledge explosion and 21st century challenges have forced educators to reconstruct and develop the whole teaching and learning process on new basics. This is consistent with the new state in an attempt to provide an interactive educational environment, which resulted in modern teaching strategies based on the use of effective approaches that are used in schools in all educational infrastructure (Noor-ul-Amin, 2013; Barahmeh et al., 2017).

Both Trilling & Fadel (2009) and Partnership for 21st Century learning skills (2009) argue that 21st century Skills (future skills) are necessary for accomplishing the required transformation. Pacific Policy Research Center (2010) suggests that one of the best practices for implementing 21st century skills is project-based learning, to prepare our students for future work and careers. It can be



considered the potential strategy to maximize students' role in learning that takes into account the principles of constructivism. Bell (2010) emphasized that project-based learning is a key strategy for creating independent thinkers and learners.

Project-based learning (PBL) is an instructional model that is centered on the students and engages them in learning knowledge and skills through learning more about problem and investigation to solve this challenge. Authentic projects require resourcefulness and preparing by the student (Dimmitt, 2017). According to the definitions found in Project -Based Learning, projects are mind boggling tasks dependent on challenging questions or issues that immerse students in design, problem-solving, decision making, or investigative activities; offer students the opportunity to work independently and freely over extended periods of time; and culminate in realistic products or presentations (Thomas, 2000; English & Kitsantas, 2013; Boss & Krauss, 2014).

In project-based learning, students are driven to learn content and skills for an authentic purpose. PBL involves students in explaining their answers to real-life questions, problems, or challenges. It starts with a driving question that leads to inquiry and investigation. Students work to create a product or presentation as their response to the driving question (Essien, 2018).

For Generation Z, the hybrid learning approach is likely to be beneficial since this group's characteristics have included a desire for face-to-face interaction, pragmatic approaches to problems, a self-reliant attitude, desires to work independently and in team settings, and the ability to quickly access multiple resources to accomplish goals and objectives (Howe, 2014; Seemiller & Grace, 2016). With such characteristics, hybrid learning environments would seem to provide substantial opportunity for learning to occur effectively with this cohort (Carter, 2018).



Collaborative learning enhances 21st century skills, as this approach divides students into groups, with each student in the group having diverse abilities and interests, and has a powerful effect on learning that gives distinctive results. The group's work is more creative because of the deep thought and integration of students' strengths and talents in order to achieve a product. The diversity of students' skills and abilities can encourage creative work (Knowlton, 2003). As a result, collaborative learning has a positive impact on student abilities, such as increasing their motivation and performance as well as developing social interaction.

Given the characteristics of Gen Z students and their learning preferences, styles, it becomes clear that they have problems with conventional learning methods and have negative attitudes towards most of them. In addition, the requirements of 21st century with its competencies and matching methodologies reveals that the traditional language learning outcomes are no longer enough for Gen Z students in higher education. New competencies are being highlighted and required. Consequently, the project- based learning approach can be considered a promising methodology to be implemented in higher education. In addition, it can have added value when accompanied with hybrid learning and also when conducted in a collaborative way. So, the current research was an attempt for integrating project- based learning with hybrid and collaborative learning for developing 21st century skills; specially the 4Cs, academic achievement and positive attitude towards PBL approach.

Context of the research:

This research was conducted at the faculty of Education, Mansoura University, Egypt. It involved two hundred and thirty junior student teachers (N= 230) enrolled in English section



studying a course entitled “EFL Teaching methods for special needs students”. The course is normally taught during the second semester of the third year of the four-year TEFL teacher preparation program. It handles the difference between special needs and mainstream students, various types of learning difficulties and disabilities such as dyslexia, dysgraphia, autism, ADHD, and other disabilities. Furthermore, the course helps students develop the professional skills required for designing, developing, and evaluating suitable techniques of early identification and teaching EFL to those students. It also provides them with a variety of practical techniques for dealing with those SEN within the context of an inclusive classroom.

The course instructor observed that the students had difficulty understanding the various learning difficulties and disabilities. Further, many students could not see the significance of studying such a course. Many students pointed this out in their feedback on the course for two successive years through the questionnaires provided by the quality assurance unit in the faculty. Therefore, the researcher decided to adopt the PBL approach to facilitate learning and make it meaningful for students.

Furthermore, the previous related studies that were reviewed and examined supported the need of higher education learners to focus on the 4Cs skills in order to meet the changing needs of the twenty-first century. For instance, (Caine, 2011; Huang et al., 2010); Van Roekel and Association (2014) affirmed that the 4Cs must be fully focused on; in order to generate citizens and workers who can handle the demands of the 21st century.

Statement of the problem

The problem of the current research was identified in the need of English Major Gen Z junior students to develop their 4Cs skills,



level of academic achievement as well as their attitude towards PBL which greatly affect their success in their study and their teaching career.

Questions of the research

The current research attempted to answer the following main question:

“What is the effect of a hybrid collaborative project-based course on developing the 21st century skills, academic achievement and attitude towards PBL among English Major Gen Z Junior student teachers?”

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

- 1- What are the features of the hybrid collaborative project-based learning course to develop the 21st century skills among Gen Z junior English major students?
- 2- To what extent is the hybrid collaborative project-based learning course effective in developing the 21st century skills among English major junior students?
- 3- To what extent is the hybrid collaborative project- based learning course effective in developing academic achievement among junior English major students?
- 4- To what extent is the hybrid collaborative project- based learning course effective in developing positive attitudes towards PBL among junior English major students?

Hypotheses

Based on the discussion of the literature and related previous studies, the following hypotheses were attempted to be verified:



- 1- There is a statistically significant difference between the mean scores of the experimental and control group students on the post- administration of the 21st Century Skills Inventory in favor of the experimental group.
- 2- There is a statistically significant difference between the mean scores of the experimental group students on the pre and post administrations of the 21st Century Skills Inventory in favor of the post- administration.
- 3- There would be a statistically significant difference between the mean scores of the experimental and control group students on the post- administration of the achievement test on the project-based course in favor of the experimental group.
- 4- There would be a statistically significant difference between the mean scores of the experimental and control group students on the post- administration of the Attitude towards PBL Scale in favor of the experimental group.
- 5- There would be a statistically significant difference between the mean scores of the experimental group students on the pre- and post- administrations of the Attitude towards PBL Scale in favor of the post one.

Instruments

The following instruments were developed by the researcher and used for collecting research data:

- 1- The Twenty First Century Skills Assessment Inventory to assess the four dimensions of the 4Cs; namely collaboration, communication, critical thinking, and creativity.
- 2- An achievement test to assess English major junior students' level in the course "EFL Teaching methods for special needs



students” after studying it using the hybrid PBL method and the traditional method.

- 3- An Attitude towards PBL Scale to assess junior student teachers’ attitudes before and after implementing the hybrid collaborative PBL course.

Purpose

The present research aimed at:

- 1- Identifying the impact of the hybrid collaborative project-based learning course on developing 21st century skills among English major junior student teachers.
- 2- Identifying the impact of the hybrid collaborative project-based learning course on developing academic achievement of English major junior student teachers.
- 3- Identifying the impact of the hybrid collaborative project-based learning course on developing positive attitudes towards PBL among English major junior student teachers.

Significance

It is hoped that the current research would contribute to:

- 1) directing the attention of EFL curriculum planners towards the importance of integrating project- based learning as a fruitful systematic approach in EFL programs at Faculties of Education.
- 2) helping EFL instructors to adapt their teaching practices to suit the requirements of developing the 21st century skills in their students through implementing project-based approach in their teaching.

- 3) facilitating the enhancement of Higher-Order Thinking Skills through the Development of the four Cs of the 21st century among EFL majors.
- 4) helping Gen Z student teachers develop positive attitudes towards collaborative PBL; as they usually tend to perform independent tasks.
- 5) attracting the attention of researchers in the field of EFL to hybrid project- based approach as a powerful means that suites the nature of technology natives and that can be employed for developing 21st century skills.

Delimitations

The current research was restricted to the following delimitations:

- 1) The 4Cs of the 21st century skills; namely, collaboration, communication, critical thinking and creativity.
- 2) A sample of 3rd year English major student teachers at Faculty of Education, Mansoura University (N= 230). They were alphabetically divided into two groups and randomly assigned to an experimental group (n= 115) who studied the course using the hybrid collaborative PBL, and a control group (n= 115) who studied the same course using the conventional method of lecturing and individual assignments.

Definition of Terms:

Hybrid collaborative project- based course:

Garrison and Kanuka (2004, p. 96) define hybrid or blended learning as “the thoughtful integration of classroom face to face learning experiences with online learning experiences.”



Holden and Westfall (2006, p.32), in contrast, provide a more elaborated explanation; hybrid learning is instruction using multiple media. This includes the integration of instructional media into a traditional classroom or into a distance learning environment and can include any combination of media that supports instruction, regardless of the mix of synchronous or asynchronous media.

PBL is simply defined as a learning strategy which is organized around projects (Thomas, 2000; Larmer, Markham & Ravitz, 2003; Bell, 2010).

Project-Based Learning (PBL) is a student-centered teaching that involves a dynamic classroom approach in which the students acquire a deeper knowledge through active exploration of real-world challenges and problems (Essien, 2018).

Project based learning is a student-centered instructional approach through which students take the control of their learning and design their projects which are the product of their collaboration and research (Bell, 2010).

According to Wurdinger et al. (2007:151), PBL can be defined as a teacher-guided method that aims to engage students in the process of creating their projects through the following the steps of “identifying a problem, developing a plan, testing the plan against reality, and reflecting on the plan”.

Within the context of the current research, the hybrid collaborative PB- course is *operationally* defined as a course that is delivered directly through face- to- face lectures and online meetings using Zoom application for online meetings where English major junior student teachers collaborate within the framework of a teacher- guided method that aims to engage them in the process of creating their projects that reflect their understanding of the course content and the way of implementing it.



21st century skills -4Cs

A set of future skills that represent higher-order thinking and social skills which are organized in cognitive skills as well as being considered as student-centered skills such as creative thinking, critical thinking, innovation, collaboration, responsibility, and communication (partnership for 21st century learning, 2009; National Research Council, 2013). The skills referred to as 4Cs include collaboration, communication, critical thinking and creativity:

Collaboration

Demonstrating the ability to work effectively and respectfully with diverse teams; exercise flexibility with willingness to help in making necessary compromises to accomplish a common goal; assume shared responsibility for collaborative work and value the individual contributions made by each team member.

Communication

Partnership for 21st century skills, (2009); Trilling & Fadel (2009) and (National Education Association, NEA) suggest that students nowadays should be able to express thoughts and ideas effectively using oral, written and nonverbal communication skills; Listen carefully to understand meaning. As well as Communicate for multiple purposes; Use many kinds of media and technologies and know how to judge their effectiveness a priority, and communicate effectively with many people and environment.

Critical Thinking

Critical thinking skills include “the ability of individuals to reason effectively, analyze, interpret, summarize and evaluate alternative perspectives, and think critically about choices and procedures”. The P21 initiative concentrated around the ability of



students to: reason adequately, use frameworks thinking; make judgments and decisions (Partnership for 21st century skills, 2009; Trilling & Fadel, 2009; & Pacific policy Research Center, 2010).

Creativity and Innovation

Partnership for 21st century skills (2009) defines creativity as “learners think creatively by using and creating a wide range of ideas; expand, refine, investigate, and assess unique ideas to improve and expand creative endeavors”.

Attitude towards PBL:

Attitude is a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor (Eagly & Chaiken 1993).

Attitude is defined by Eagly and Chaiken (2007) as the way in which a person views and evaluates something or someone, a predisposition or a tendency to respond positively or negatively toward a certain idea, object, person, or situation. It is traditionally structured along three dimensions: cognitive (perceptions and beliefs), affective (likes and dislikes, feelings, or evoked emotions), and behavioral (actions or expressed intentions toward the object based upon the “cognitive” and “affective” responses).

Attitude towards PBL can be operationally defined in the current research as the way in which Gen Z junior student teachers view and evaluate the project- based learning approach as indicated through the significance of the difference between their mean scores on the pre- and post- administrations of the Attitude Towards PBL Scale.

Gen Z



Generation Z was born after 1995, they grew up using social networks and are even more digitally oriented than the Generation Y, thus requiring a different analytical approach. This Generation also has many other names, such as: Gen Tech, Children of Internet, Post-Millennials, Generation I, Digital Natives, Gen Wii, Media Generation, .com Generation, iGen (Stjepić, Vukšić& Suša Vugec, 2019).

Members of this group are avid consumers of technology and cravers of the digital world. As true digital natives and the only generation raised exclusively with a technology influence, Generation Z is highly accustomed to interacting, sometimes solely, in the digital world (Chicca& Shellenbarger, 2018).

Review of Literature and related studies:

The 21st-century learning has eventually transformed today's classroom. With more digital natives in the class, both educators and students face a changing classroom that should accommodate different learning paces, styles and needs. To help students progress in today's technology- aided competing universe, along with fostering knowledge acquisition in any particular field, educational systems are supposed to incorporate 21st century skills into teaching to fill the gap between students' knowledge of the field and the competencies required to use the acquired knowledge (Arabloo et al., 2021)

21st century skills:

The term “21st century skills” refers to the set of skills identified by the Partnership for 21st Century Skills, the key national organization focused on infusing 21st century skills into education. Clearly, twenty-first century skills is a broad term that refers to the knowledge, skills, and practices that are generally acknowledged to be critical for today's learners to possess in order to be successful in



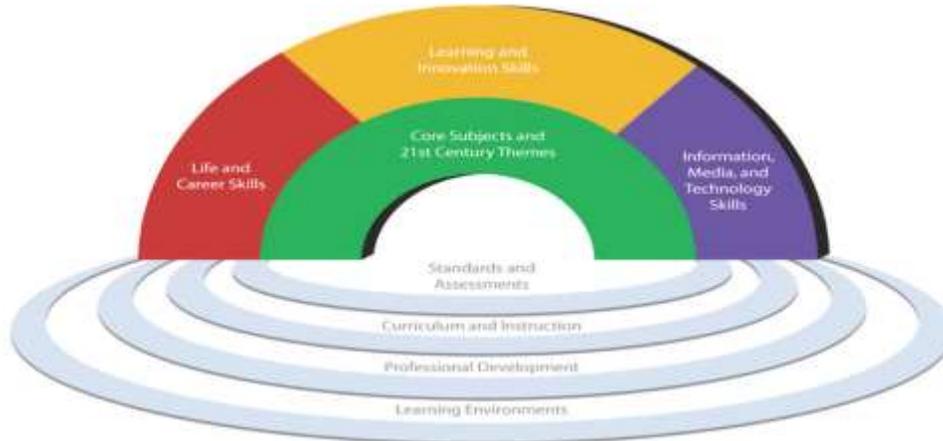
work and life (American Association of Colleges of Teacher Education, 2010). For students to master 21st century skills requires the support of teachers who are well trained and supported in this type of instruction (Pacific Policy Research Center, 2010).

The Partnership for 21st Century Skills has developed a framework for 21st century learning, which describes the skills that students need to succeed in today's global economy and advocates for the integration of skills such as critical thinking, problem solving and communication into the teaching of core academic subjects such as English, reading or language arts, world languages, arts, mathematics, economics, science, geography, history, government, and civics". As the most prominent and well-known framework of 21st-Century skills in the field of information technology in education, P21 classified eleven skills into three gist elements:

- Critical Thinking and Problem Solving
- Communication and Collaboration
- Creativity and Innovation

Figure 1: The Framework for 21st Century Learning model

21st Century Student Outcomes and Support Systems



Source: Partnership for 21st Century Skills (2009, p.9)

The Framework is divided into four main components of learning: 1) Core Subject and 21st Century Themes, which includes all core subjects, global awareness, financial, economic, business and entrepreneurial literacy, civic literacy, and health literacy, 2) Learning and Innovation Skills, which includes creativity and innovation, critical thinking and problem solving, and communication and collaboration skills, 3) Information, Media and Technology Skills, which includes information literacy, media literacy, and information, communications, and technology literacy and 4) Life and Career Skills, which includes flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility skills (Partnership for 21st Century Skills, 2009)

Also, the ATC21S researchers concluded that 21st Century skills can be grouped into four broad categories: (Binkley, Erstad, Herman, Raizen, Ripley and Rumble, 2010, p. 8).



1. Ways of Thinking: Creativity and innovation, critical thinking, problem solving, decision making, learning to learn, metacognition
2. Ways of Working: Communication, collaboration (teamwork)
3. Tools for Working: Information literacy, ICT literacy
4. Living in the World: Citizenship – local and global, life and career, personal and social responsibility – including cultural awareness and competence

The current research focuses on the 21st-Century skills proposed by Partnership for 21st-Century Learning (P21) particularly on the learning and innovation skills which are known as 4Cs. Moreover, P21 is considered the most influential of the various initiatives promoting 21st-Century (Bourn, 2018). Based on the P21 (2019), learning and innovations skills (the 4Cs) cover creativity, critical thinking and problem-solving, communication, and collaboration. Saxena (2014) conveyed that those 4Cs super skills for the twenty-first century assist students to develop the qualities needed for success in college, career, and citizenship. As a result, those skills must be incorporated into curriculum design, taught, and evaluated in education or anywhere else (Geisinger, 2016).

Creativity is referred to as trying new techniques to get things done, as well as innovation, and invention (Beth, 2016). Ideas, innovative ways of viewing an issue, and real actions to do new things that benefit the environment are all generated by creative skills (Rochmawati et al., 2019). P21 (2019) characterized creativity and innovation by thinking creatively (i.e. use a wide range of idea generation techniques, create new and worthwhile ideas, elaborate the ideas), working creatively with others (i.e. communicate new ideas, be open to different perspectives, demonstrate originality,



working by self-direction), and implementing innovations (i.e. contributing to the field).

Critical thinking and problem-solving emphasize new approaches to problems and the integration of knowledge from various subjects and disciplines (Saxena, 2014). Critical thinking skills are the ability to think deeply from a range of viewpoints to come up with effective solutions (Rochmawati et al., 2019). There are some indicators of critical thinker proposed by P21 (2019), they are who reason effectively, use system thinking, make judgments and decisions (i.e. analyze and evaluate arguments, synthesize, interpret information, reflect on learning) and solve problems (i.e. solve the non-familiar problem, clarify the various point of view and lead to better solutions).

Communication skills are a person's action in conveying information to others including thoughts, queries, ideas, and solutions (Beth, 2016; Rochmawati et al., 2019). The simultaneous convergence of people from many cultures assisted by 21st Century knowledge, media, and digital technology has made the necessity for effective communication more apparent and critical than in previous generations. The indicator of a good communicator is communicating clearly. To communicate clearly, people should be able to effectively express thoughts and ideas using written, nonverbal, and oral communication skills; listen effectively to comprehend meaning; use communication for a variety of purposes; utilize various media and technologies; and communicate effectively in diverse settings (P21, 2019).

Collaboration is the way people perform effectively and respectfully in teams to solve problems or answer questions, to achieve a common goal, to accept joint responsibility for the completion of a mission by putting talent, expertise, and smarts to work (Beth, 2016; Ravitz et al., 2012; Rochmawati et al., 2019). A



successful collaboration can be indicated if they can collaborate with others (P21, 2019) including asserting the teamwork skills efficiently and respectfully with a diverse group of people, exercising flexibility and willingness to make compromises in achieving the shared goals, take shared responsibility and recognize each team member's contributions. Students with collaboration skills can develop diverse viewpoints and, as a result, they are able to express and defend their own ideas (Kulikovskikh et al., 2017).

The focus of educators today is to equip students with 21st-century skills. Mastering 4Cs has been a necessity for students in order to develop the qualities for success in college, work, and citizenship in the twenty-first century. The demand for 21st-century skills is significant, and it necessitates more forward-thinking innovation. Those skills must be incorporated into curriculum design, taught, and evaluated in education or anywhere else (Geisinger, 2016).

Generation Z:

Generation X refers to those born between 1965 and 1979, ages 39 to 51; Generation Y, also known as the Millennials, born between 1980 and 1994, ages 24 to 38 years old; and Generation Z are individuals born between 1995 and 2015, ages 3 to 24 years old (Pew Research Center, 2018). Each of these generations is unique in their own right; however, each generation can be characterized by distinctive collective features that have been shaped by the world they entered into and lived in (Betz, 2019).

Generation Z is the first generation to grow up in an Internet world wherein their understanding of access to information and the world view has been shaped in a manner unlike previous generations (Adamson, Chen, Kackley, & Micheal, 2018; Prensky, 2001). Other labels have been ascribed to this newest generation such as Post-



Millennials (ages 6 to 21 years of age), iGen, iGeneration, digital natives, and home landers. This generation is accustomed to rapid diffusion of information presented in a graphically and technologically sophisticated style. “Growing up in a virtual cloud of technology with infinite sources of information and digital interactions has changed the way they think, communicate and learn” is an apt description of this newest generation (Adamson et al., 2018, p.29).

Students from each generation possess specific and unique characteristics due to the circumstances they grew up in (e.g. economic, social and cultural conditions) and these characteristics affect their perception of formal learning (Shorey, Chan, Rajendran & Ang, 2021).

On one hand, Millennials are tech-savvy, prefer a collaborative learning style with blended learning and have effective in-person and online communication skills (Issacs et al., 2020). They desire constructive and immediate feedback, are highly connected on social media and are idealistic risk-takers (Issacs et al., 2020; Chicca and Shellenbarger, 2018). On the other hand, Gen Z students are digital natives who prefer an independent learning style with less passive but more visual and kinaesthetic learning. They also desire convenience and are open to honest feedback (Issacs et al., 2020). Due to the extensive reliance on technology, Gen Z students have underdeveloped in-person social skills as they lack in the art of conversation (Seemiller and Grace, 2016; Chicca and Shellenbarger, 2018). Despite being highly connected on social media, they value privacy and are pragmatic and entrepreneurial (Issacs et al., 2020; Chicca and Shellenbarger 2018). The similar yet distinct characteristics of the millennials and Gen Z have necessitated the need for educators to alter educational practices, pedagogies and



teaching approach to provide an optimal and holistic learning environment that meets their learning needs (Shorey et al., 2021).

Based on a review that included seventeen studies published between 2016 and 2021, Shorey et al. (2021) highlighted the attributes of Gen Z students as digital natives who relied mainly on technology in daily living (i.e. spend about nine hours per day on their electronic devices) resulting in underdeveloped social skills that placed them at risk for mental health concerns (e.g. depression, anxiety and insecurity). In addition, they are exposed to constant technological stimulation, display short attention span, seek instant gratification. It was highlighted that this generation are open-minded and accepting of difference. Growing up in uncertain times, this generation is pragmatic, concerned and cautious about the future (e.g. physical, emotional and financial security) hence are less willing to take risks but more likely to have options and alternative plans. They demonstrate a high level of social awareness given the rapidness and availability of news and climate of opinions and advocate for societal injustices (e.g. institutionalized discrimination). They also value close mentoring relationships.

Innovative methods that integrate social interactions, technology, and academic requirements are necessary for a dynamic learning environment that suits the characteristics of Gen Z learners. Collaborative projects, group-based assignments, blended learning approach are among the highly recommended approaches (Shorey et al., 2021). The following table summarizes characteristics of Gen Z and the suitable teaching- learning strategies and approaches to support them.

Table 1: Generation Z characteristics and teaching–learning design strategies and approaches to support them (Adapted: Chicca& Shellenbarger, 2018).

<i>Characteristic</i>	<i>Teaching–learning design strategies and approaches to support Generation Z</i>
-----------------------	-----------------------------------------------------------------------------------

High consumers of technology and cravers of the digital world	Instruct how to assess the credibility, relevance, and accuracy of digital sources and how to research and cite properly <ul style="list-style-type: none"> • Use online tutorials or videos to demonstrate information literacy concepts
	Explain the ethical responsibilities related to confidentiality and social media use
	Select a few technology platforms for use in instruction: <ul style="list-style-type: none"> • Virtual learning environments • Hybrid or blended courses • Readings that can be completed on tablets and or smartphones • Use available online learning resources, such as Kahn Academy or CrashCourse
Pragmatic	Adopt interactive e-textbooks where possible
	Encourage students to use their own technology when engaging in class activities
	Employ experiential learning
	Incorporate real-life experiences into course content and clearly connect theory content to real-life experiences <ul style="list-style-type: none"> • Tell a clinical story • Link classroom learning to clinical experiences
	Feedback, feedback, feedback
Underdeveloped social and relationship skills	Offer convenient faculty office hours or electronic office hours
	Show up early and or stay late after class to engage students in discussions
	Explain and demonstrate group processing and interpersonal skills, such as active listening, providing constructive criticisms, and respecting others' perspectives
	Revise group and cooperative learning assignments <ul style="list-style-type: none"> • Assign group roles • Focusing the group to help edit and refine the project • Provide guidelines for group work
Cautious and concerned with emotional, physical, and financial safety	Help students engage in dialogical conversations that is, respectful, open conversations with someone with whom they disagree, especially regarding controversial and or sensitive topics
	Require learners to gain responsibility <ul style="list-style-type: none"> • Consider using learning contracts, especially for practicum

	<p>experiences</p> <ul style="list-style-type: none"> • Provide choices in assignment topics when possible • Spread out assignment portions to curb assignment binging and procrastination
Individualistic	<p>When appropriate, allow students to work independently and at their own pace.</p> <ul style="list-style-type: none"> • Self-study online modules
	<p>As possible, flexibility in curriculum and/or coursework is advisable.</p> <ul style="list-style-type: none"> • Electives, course sequencing options • Select from menu of course assignments
Increased risk for isolation, anxiety, insecurity, and depression	<p>Recognize changes in student behavior and early warning signs, such as suddenly missing class</p>
	<p>Reassure students and nurture participation in class</p>
	<p>Refer students to appropriate resources</p>
	<p>Student identify classmate and record contact information for a class peer</p>
Lack of attention span, desiring convenience and immediacy	<p>Set realistic expectations for students in terms of faculty availability</p>
	<p>Help focus attention with short bursts of teaching</p>
	<p>Regularly switch between teaching–learning modalities during a class session</p> <ul style="list-style-type: none"> • To engage students with short attention spans, use various modalities, such as lecture, discussion, videos, demonstration
	<p>Aim for depth versus breath of information</p>
	<p>Carefully select readings to include only necessary information</p>
	<p>Use active teaching–learning techniques</p> <ul style="list-style-type: none"> • Concept mapping • Flipped classroom • Case studies • Problem-based learning
	<p>Facilitate class discussions on inclusiveness and tolerance</p>
Open-minded, diverse, and comfortable with diversity	<p>Focus group work on varied viewpoints with heterogenous groups of students</p>
	<p>Nurture a creative spirit in students, encouraging innovation, creativity, and growth</p>
	<p>Use varied methods to teach and assess learning</p>



Because they see themselves as problem-solvers who prefer to work alone, Gen Z may appreciate jigsaw formats in which individual students seek information online to contribute specific elements to a larger project. However, perhaps due to their 24/7 access to what is happening in the world, they are less interested in current events. The challenge, therefore, is to devise shared projects to which individual students contribute portions, while focusing on problems that they face personally (Mohr& Mohr, 2017).

In an attempt to orient the teaching toward 21st Century Skills, the teacher needs to choose a teaching method that engages pupils in the teaching and learning process but also helps students to master the 4Cs. Besides, in order to make an enjoyable teaching and learning process, the teacher should be creative and innovative in using technology as media in the teaching method application. PBL is considered as one possible way to support a student's collaborative and communication skills through group work and social interaction to solve problems. PBL also encourages students to not only complete the phases of class projects that are relevant to their interests and needs but also to acquire the capacity to think critically and apply content knowledge. During PBL, the teacher and students have a direct interaction in developing the project in the classroom (Haniah et al., 2021).

Project-based language learning (PBL), as a learning style that organizes learning around projects, is viewed as a breakthrough in 21st century learning and facilitates the realization of student-centered classrooms by virtue of active participation (Astawa et al., 2017; Bell, 2010). PBL has been widely accepted as an effective approach to cultivating both 21st century and language learning skills (Fandiño, 2013). Being evaluated as an effective learning model which helps learners analyze problems, investigate possible solutions, make decisions, create designs, and solve problems, PBL



is presumed to be capable of incorporating 21st century skills into an English as a foreign language (EFL) classroom (Gardner, 2000). Going through a sequence of purposeful processes including planning, sharing the responsibilities, putting the plan into action, conducting either self or peer assessment of the results, and reporting the outcomes, students could build a relationship through which the development of various social and communicative skills may take place (Bell, 2010).

Project-Based Learning (PBL) is a student-centered teaching that involves a dynamic classroom approach in which the students acquire a deeper knowledge through active exploration of real-world challenges and problems (Essien, 2018). Several studies have revealed project-based instruction as being capable of providing English language learners with prospects for comprehensible output and integrated language learning. For instance, PBL proved to be effective in enhancing EFL writing skills (Thitivesa& Essien, 2013; Giawa, 2022; Ilham, 2022), EFL productive skills (Astawa, Artini & Nitiasih, 2017), and language proficiency improvement in general (Arabloo et al., 2021; Yaprak, 2022). Moreover, PBL has a significant effect on improvement of 21st century skills (4Cs) among secondary school students (Bani-Hamad& Abdullah, 2019; Badr, 2021; Haniah et al., 2021; Sari& Prasetyo, 2021).

According to the previous studies related to this research, PBL brought enhancements for the students, along with advantages. For example, Imtiaz and Asif (2012) proved that PBL played an important role in improving students' language skills and promoting students' autonomous learning skill in Pakistan. Vicheanpant and Ruenglerpanyakul (2012) and Al- Bahadli et al. (2023) proved effectiveness of PBL in developing students' communication skill which came along with more positive attitude, motivation, and engagement in learning. In addition, Nassir (2014) verified



significant difference on Iraqi students' English achievement before and after being taught by using PBL. Furthermore, Rochmahwati (2016) specifically found a positive impact on Indonesian students' EFL speaking skill before and after being taught by using PBL. The finding came along with the positive improvement on students' attitudes towards language learning. Finally, in relation to improving learning outcomes of student teachers, both studies of Al- Busaidi et al. (2021) and Busayairi et al. (2023) confirmed the effectiveness of PBL as a tool for student teachers' professional development and as an important tool of synergy between theoretical and practical aspects of preservice teacher education.

Since projects are often complex, students are grouped together to work, which nurtures communication skills and boosts even students with different and possibly contradictory dispositions to find a mutual ground, or at the very least a way to work together without continuous pressure. Part of this teamwork building helps introduce students to the specialization and delegation that are extremely prominent in the real world (Essien, 2018). From the part of the students, PBL was found to improve enthusiasm, confidence, creativity, self-directed learning and collaborative learning skills. On the part of the teacher, PBL promotes teaching motivation and satisfaction (Astawa, Artini & Nitiasih, 2017).

Whilst technology is a major component of Gen Z student's learning, blended or hybrid learning has proven to improve the learning outcome for theoretical knowledge to a greater level than either face-to-face learning or e-learning alone (Bock et al., 2021). Effective use of different learning spaces, such as face-to-face and online learning together, can provide improved interaction, collaboration and continuous feedback opportunities for students, helping them to reflect on their learning (Santosa, 2017). Hybrid learning should be viewed as a pedagogical approach that combines



the effectiveness and socialization opportunities of the classroom with the technologically enhanced active learning possibilities of the online environment, rather than some arbitrary ratio of delivery modalities. In other words, it should be approached not merely as a temporal construct, but rather as a fundamental redesign of the instructional model (Dziuban, Hartman & Moskal, 2004).

Hybrid or blended learning taps multiple resources in order to bridge the gulf between ordinary, everyday classrooms and the twenty-first century skills that the learners need to acquire. As the growth of online learning is the educational phenomenon of the twenty first century (Gil & Garcia, 2011), the goal of a blended course should be to combine the best features of in- class teaching with the best features of online learning to promote active, self-directed learning opportunities for students with added flexibility (Jacobsen, 2011). It can help university teachers offer student-centered and active learning, which can promote student learning of important twenty-first century skills, such as communication, information literacy, creativity and collaboration and developing the ability to use digital technologies for a range of purposes (Garrison& Kanuka, 2004; Zurita, Hasbun, Baloian & Jerez, 2015). It can also be an effective means of establishing learning communities that work together to build knowledge through such processes as inquiry, reflection and discourse (Oakley, 2016).

The advantages of hybrid learning have been thoroughly examined in research studies on language learning. The majority of studies were carried out to observe changes in students' behavior and performance. They signposted that blended learning enhances the language skills development (Albiladi & Alshareef, 2019; Jia et al., 2012; Miyazoe and Anderson, 2010), boosts the English language learning contexts (Shih, 2010) , and encourages learners to learn the language authentically (Albiladi & Alshareef, 2019) . These studies



also demonstrated improved student performance and academic achievement (Zhang & Zhu, 2018; Oweis, 2018), motivation (Oweis, 2018) and a favorable attitude toward hybrid English courses (Shih, 2010).

To conclude, it is clear that implementing PBL approach in instructional practices could be a fruitful means for achieving intended learning outcomes. It is hopefully expected to be more effective if restructured in a hybrid way, where there is a mixture of face-to-face instruction and online meetings. It is a promising approach that would allow GenZ student teachers to collaborate in order to achieve the target of solving a real problem and developing crucial skills needed in the 21st Century. Finally, its effects on academic achievement would be also promising, as students work hard to make use of theoretical knowledge they acquired in a practical way that would contribute to having an original product.

Attitudes towards PBL:

Attitude is a convenient and efficient way of explaining consistent patterns in behavior. It often manages to summarize, explain and predict behavior (Baker, 1992). It means that someone's attitude toward something can be seen from the way they say, and act related to the attitude object. Attitude implies evaluation, which is usually done a bipolar continuum from favorable to unfavorable, or from positive to negative, that could comprise attributes such as good-bad, harmful-beneficial, pleasant-unpleasant, and likeable-dislikeable (Azjen, 2001).

Baker (1992) argued that language attitude change can be prompted by personal experiences, significant events (e.g., violent episodes and mass protests), communities, families, peer groups, institutions, and mass-media. Moreover, Mantle-Bromley (1995) showed that specially designed language learning programs can



improve language attitudes. Additionally, Gardner and his associates (2004) found that the classroom environment and students' academic results also determined changes in language attitudes. Nonetheless, the authors concluded that 'the possibility of change is not great, but it is larger for variables directly associated with the classroom environment than for more general variables' (Gardner et al., 2004, 28). Thus, it can be assumed that enhanced learning environments can lead to positive change of attitudes.

Components of attitude

It is generally accepted that attitude represents the positive or negative mental and neural readiness towards a person, place, thing or event. According to the ABC model; one of the most cited (Eagly & Chaiken, 1998; Van den Berg et al., 2006) models of attitude, it has three elements i.e. Affect, Behavior and Cognition. Consequently, attitude consists of three components: an affective component (neural) (feeling/ emotion), behavioral component (readiness) (response/ action), and a cognitive component (mental) (belief/ evaluation). These components are illustrated as follows (Jain, 2014):

Affective Component

The affective element is the emotional reaction (liking/disliking) to an attitude object. The majority of the research emphasizes the significance of emotive components. Because emotion and cognition regarding an attitude object interact simultaneously, an individual's attitude towards an object cannot be inferred from just knowing their beliefs about it. Regarding PBL, when students have positive or negative attitudes towards PBL, they can have a great effect on their learning strategies (Railsback, 2002).

Cognitive Component



An assessment of the element that makes up a person's opinion (belief or disbelief) about the object defines the cognitive component. Cognitively speaking, an attitude object is something that a person thinks and believes about. A belief is defined by Fishbein & Ajzen (1975) as knowledge a person has about an object; knowledge that specifically connects an object and attribute. The storage area where information is organized by a person is the cognitive component. In terms of PBL, it is believed that when people associate an object with positive attributes, they have more positive attitudes toward it.

Behavioral Component

The behavioral element is a verbal or nonverbal behavioral propensity by an individual and it comprises of actions or observable responses that are the outcome of an attitude object (Wicker 1969). It involves a person's reaction (positive or negative) to an action with reference to an attitude object. More often than not, attitudes are predictable. In other words, a succession of reactions to a specific attitudinal stimulus is likely to exhibit some kind of organizational structure or predictability.

Although these three components are distinct processes, they function in an integrated and interrelated fashion to express the attitude. Since they all belong to the same attitude, they function in a consistent manner. Each of these components influences the other two and therefore, changes in one component attitude leads to the changes in other components. This process makes the attitude itself dynamic.

According to Komol and Suwanphathama (2020), there are two types of attitudes, positive attitudes and negative attitudes. Obviously, learning performance can be enhanced and facilitated when students have positive attitudes. However, students'



performances and results in language acquisition may deteriorate if the students have negative attitudes. Students form their attitude based on their judgment on certain objects' usefulness or value to them. In addition to positive and negative attitudes, there was neutral attitude, when people tended to have a non-dominant attitude, not positive or negative (Tella, Indoshi, & Othuon, 2010; Tran & Tran, 2020).

Attitudes, along with cooperation in teamwork, and 21st century skills are the key factors that help project-based learners reinforce their learning ability, attain insightful comprehension on conceptual knowledge, and promote their learner autonomy (Tella, Indoshi, & Othuon, 2010; Tran & Tran, 2020). In terms of the students' attitudes towards PBL, only a few studies have recently been conducted. Han (2017) conducted a study in six secondary schools in Korea to investigate the students' attitudes towards science, technology, engineering, and mathematics (STEM) PBL. The results of the study showed that the students who had positive attitudes towards PBL were in favor of choosing STEM major in the future. In another study by Haryatti (2017), the researchers aimed to determine the students' attitudes towards the use of PBL in the application of Computer Assisted Language Learning (CALL). The results revealed that the students' attitudes towards PBL were positive. In general, most of the recent studies indicated that students expressed positive attitudes towards PBL.

Methodology:

The following section includes participants, design, instruments, and the treatment procedures followed in the current research.

Participants:



Participants in the research were two hundred and thirty Gen Z junior student teachers (N= 230) enrolled in the third year of English Major Program at Faculty of Education, Mansoura University during the academic year 2021-2022. They were alphabetically divided into two groups; the first half of the whole section was the control group, and the second half was assigned to be the experimental one. Both groups studied “Methods of Teaching EFL for Special Needs” course. However, the experimental group (n=115) were taught by the researcher through implementing the collaborative project- based approach, while the control group (n= 115) was taught by another instructor through the traditional method of lectures and having some individual assignments of preparing application activities. Both groups studied the same course for the first time. Students’ ages ranged between 19 and 20 years old. They had almost the same experience of learning English as a foreign language; starting from the first year at the primary stage. They constituted a homogenous group of Gen Z students who graduated from the literary section at the general secondary stage.

Design:

The current research adopted the quasi-experimental approach using a pre- post administration to two independent groups design to investigate the effectiveness of using a hybrid collaborative project-based course for developing 21st century skills, academic achievement, and attitude towards PBL among Gen Z junior English major student teachers at faculties of Education.

Instruments:

The following instruments were designed by the researcher and administered for achieving the purposes of the current research:

(1) The 21st Century Skills Assessment Inventory

The 21st Century skills assessment inventory is a self-assessment tool that was designed to measure the level of Gen Z English major junior student teachers' level in the four component dimensions before and after the experimental treatment. Self-assessment is viewed as a formative strategy. Its main purpose is to identify the students' own strengths and weaknesses and to work to make improvements to meet specific criteria. Self-assessment is used to promote self-regulation, to help students reflect on their progress and to inform revisions and improvements on a project.”

The inventory consisted of forty- five statements distributed to four dimensions: collaboration, communication, critical thinking and creativity. There were some negative statements to guarantee the validity and consistency of students' responses to the inventory. The specifications of the inventory are illustrated in table (2) below:

Table (2): Specifications of the 21st Century Skills Assessment Inventory

Skills	No. of statements	Negative statements no.
1- Collaboration	1- 12	3
2- Communication	13- 24	22
3- Critical thinking	25- 33	28
4- Creativity	34- 45	37, 42

Students were asked to rate these statements on a five-point agreement Likert scale ranging from (5) strongly agree to (1) strongly disagree to reflect upon and assess their level in each skill.

To assess the validity of the inventory, it was presented to a number of TEFL specialists to evaluate the statements in terms of their appropriateness and clarity. The jurors provided their points of view indicating that the inventory was clear and appropriate to assess students' 21st century 4Cs skills.

The internal consistency and reliability of the 21st Century Skills Assessment Inventory were estimated through the inventory pilot administration to (30) students other than the sample of the study. Results of this pilot study were as follows:

First, for the internal consistency of the scale, the Pearson correlation coefficient between the score of each statement and the total score of the main skill of the 4Cs to which it belongs was estimated, and the results are presented in the following table.

Table 3: The correlation between the score of each statement and the main 21st century 4 Cs skills

MAIN SKILLS	N	CORRELATION COEFFICIENT	MAIN SKILLS	N	CORRELATION COEFFICIENT
(1) COLLABORATION	1	0.753**	(3) CRITICAL THINKING	25	0.93**
	2	0.771**		26	0.84**
	3	0.762**		27	0.73**
	4	0.633**		28	0.69**
	5	0.784**		29	0.78**
	6	0.693**		30	0.79**
	7	0.69**		31	0.82**
	8	0.58**		32	0.86**
	9	0.753**		33	0.77**
	10	0.836**		34	0.69**
	11	0.818**		35	0.8**
	12	0.755**		36	0.803**
(2) COMMUNICATION	13	0.684**	(4) CREATIVITY	37	0.76**
	14	0.8**		38	0.72**
	15	0.803**		39	0.78**
	16	0.736**		40	0.75**
	17	0.617**		41	0.84**
	18	0.784**		42	0.66**
	19	0.753**		43	0.81**
	20	0.837**		44	0.69**
	21	0.653**		45	0.86**
	22	0.84**			
	23	0.79**			
	24	0.86**			

****Correlation is significant at the 0.01 level.**

Correlation coefficients were significant at 0.01 level of significance as illustrated in table (3), which indicates a strong relationship between the scores of the statements of the scale and those of the main 4 Cs skills.

Second, for the hypothesized consistency of the scale, the correlation coefficient between the score of each main skill and the total score of the inventory was assessed. The results are presented in the following table.

Table 4: The correlation between the score of each main skill and the total score of the inventory

Main skills	Correlation Coefficient	Sig
Collaboration	0.91	0.01
Communication	0.892	0.01
Critical thinking	0.767	0.01
Creativity	0.89	0.01

Based on the results in table (4), it is clear that correlation coefficients were positive and statistically significant at 0.01 level of significance. This indicates that the inventory had a valid internal consistency.

Reliability of the inventory:

Reliability of the inventory was estimated through Cronbach's Alpha method, where the variance of the scale items was calculated. Through this method, the correlation between the statements together, and between each statement and the total score of the inventory is being illustrated. Results were as follows:

Table 5: Cronbach's Alpha reliability coefficient for the 21st century Skills Assessment Inventory

MAIN SKILLS	N OF ITEMS	CRONBACH'S ALPHA
COLLABORATION	12	0.86



MAIN SKILLS	N OF ITEMS	CRONBACH'S ALPHA
COMMUNICATION	12	0.89
CRITICAL THINKING	9	0.74
CREATIVITY	12	0.81
TOTAL	45	0.904

It is evident that reliability coefficient for the whole inventory equals (0.904) which means that the inventory was suitable for the purposes of the research.

Duration of responding to the Inventory:

Time for responding to the statements of the inventory was estimated through recording time spent by each student in the piloting of instruments and then estimating the mean time needed for responding to the inventory. Time estimated was about 35 minutes.

Thus, the 21st Century Skills Assessment Inventory was ready in its final version to be applied in the research (see Appendix A) *.

(2) The Academic Achievement Test

The purpose of the test was to measure the actual level of junior student teachers' knowledge of the course content after applying the PBL course, and thus determining the effectiveness of the treatment in developing academic achievement of the course.

The test included two types of questions; multiple choice and true/ false questions distributed to the cognitive levels of Bloom's taxonomy. The first part consisted of 15 multiple choice questions and the second part consisted of 20 true/ false questions. The researcher relied upon the course specification to formulate the questions of the test. The total score of the test was 70 marks; 2 marks were assigned to each question.

Test validity

* Appendices are available from the researcher upon request.

To measure content validity of the test, the first version of the test was presented to TEFL professors (N= 3) to evaluate it in terms of suitability of the questions, and difficulty level. The test proved to be valid as the jurors approved it.

Piloting the test:

In order to estimate test structural validity (internal consistency) and reliability, the achievement test was administered to a pilot sample other than the sample of the main study (n=30).

First: Structural Validity (Internal consistency) of the test:

In order to estimate the internal consistency of the achievement test, correlation coefficients between the scores of each question and the total score of the main level to which it belongs, and between the scores of each question and the total score of the test were calculated.

First, values of correlation coefficients between the score of each question in relation to the total score of the cognitive level to which it belongs were as follows:

Table 6: Values of correlation coefficients between questions and cognitive levels of the achievement test

Cognitive level	No.	Correlation Coefficient	Cognitive level	No.	Correlation Coefficient	Cognitive level	No.	Correlation Coefficient
Remembering	1	0.723**	Higher-order levels	14	0.665**	Higher-order levels	12 b	0.723**
	2	0.888**		1b	0.75**		13 b	0.41*
	13	0.759**		2b	0.816**		14 b	0.71**
Understanding	9	0.622**		3b	0.849**		15 b	0.4*
	10	0.8**		4b	0.467**		16 b	0.823**

	15	0.726**		5b	0.433*		17 b	0.492**
Applying	7	0.715**		6b	0.725**		18 b	0.515**
	12	0.692**		7b	0.563**		19 b	0.483**
Higher- order levels	3	0.723**		8b	0.695**		20 b	0.62**
	4	0.592**		9b	0.65**			
	8	0.565**		10 b	0.685**			
	11	0.783**		11 b	0.65**			

**Correlation is significant at the 0.01 level

*Correlation is significant at the 0.05 level.

Based on the statistics in table (6), almost all correlation coefficients were statistically significant at 0.01(except for items no. 13b& 15b were significant at 0.05 level). This indicates a strong correlation between the scores of each item and the total score of the level to which it belongs.

Second, for the hypothesized consistency of the test, the correlation coefficients between the score of each cognitive level and the total score of the test were assessed. The results are presented in the following table.

Table 7: The correlation between the score of each cognitive level and the total score of the test

COGNITIVE LEVELS	CORRELATION COEFFICIENT	SIG
REMEMBERING	0.706	0.01
UNDERSTANDING	0.87	0.01
APPLYING	0.91	0.01
HIGHER- ORDER LEVELS	0.817	0.01

Based on the results in table (7), it is clear that correlation coefficients were positive and statistically significant at 0.01 level of

significance. This indicates that the test had a valid internal consistency.

Reliability of the achievement test:

Reliability of the test was estimated through Cronbach's Alpha method, where the variance of the test items was calculated. Through this method, the correlation between the questions in each cognitive level, and between each level and the total score of the test is being illustrated. Results were as follows:

Table 8: Cronbach's Alpha reliability coefficient for the achievement test

THE WHOLE TEST	N OF ITEMS	CRONBACH'S ALPHA
TOTAL	35	0.799

It is evident that reliability coefficient for the whole test equals (0.799) which means that the test was suitable for the purposes of the research.

Calculating the ease and difficulty coefficient and the discrimination coefficient for the test items:

The ease and difficulty factor for each test item was calculated through the following equation:

Ease factor = number of correct answers/ (number of correct + incorrect answers) (for questions one or zero), and ease factor = students' Mean score/ question maximum score (for questions that are scored out of 2)

It was found that the ease coefficients ranged between (0.2-0.8).

The **discrimination coefficient** was calculated for each test item through the following equation:

$\sqrt{(\text{Difficulty factor} \times \text{Ease factor})}$ = Discrimination factor, and it was in the acceptable range of (0.4- 0.5).

Duration of the test:



The test was structured to be answered within the limits of two- hour duration according to the regulations of the faculty.

Consequently, the academic achievement test was ready in its final version for administration in the research (see Appendix B).

(3) The Attitude Towards PBL Scale:

The attitude towards PBL scale aimed at assessing students' evaluation of PBL before and after experiencing it. It consisted of three dimensions reflecting the components of attitude according to the ABC Model, including twenty statements at a 5-point Likert type scale ranging from 'strongly disagree' to 'strongly agree'. Among the statements of the scale, two negative statements in the second dimension were included for more valid responses from the students.

Concerning the process of scoring the responses on the scale and recording them, it was done in the light of the alternatives provided for the students; strongly disagree= 1, disagree= 2, not sure= 3, agree= 4, strongly agree= 5. The negative statements were scored in the opposite direction; strongly disagree= 5, disagree= 4, not sure= 3, agree= 2, strongly agree= 1.

Content validity of the scale:

In order to check the validity of the scale, it was presented to a group of jurors for validation and to suggest any recommended changes. Very few words were recommended to be changed and replaced with clearer ones. These suggestions were carried out and the difficult words were replaced with clearer synonyms that suite the level of the students. It was then ready for administration in its final form.

Structural Validity (Internal consistency) of the scale:

In order to estimate the structural validity of the scale, it was piloted to a sample of thirty students (n= 30) other than participants

in the main study. The internal consistency of the Attitude towards PBL scale was estimated using correlation coefficients between the score (frequencies) of each statement and the dimension to which it belongs, and between the score (frequencies) of each dimension and the total score of the scale were calculated. First, values of correlation coefficients between the score of each statement in the scale in relation to the total score of the dimension to which it belongs were as follows:

Table 9: Values of correlation coefficients between statements and dimensions of the scale

Dimensions	No.	Correlation Coefficient	Dimensions	No.	Correlation Coefficient
(1) Feelings	1	0.747**	(3) Taken Actions	11	0.865**
	2	0.812**		12	0.73**
	3	0.717**		13	0.873**
	4	0.715**		14	0.873**
	5	0.765**		15	0.887**
	6	0.751**		16	0.893**
(2) Thoughts and Beliefs	7	0.712**	17	0.873**	
	8	0.723**	18	0.908**	
	9	0.761**	19	0.885**	
	10	0.676**	20	0.806**	

****Correlation is significant at the 0.01 level.**

Results in table 9 illustrate that correlation coefficients were significant at (0.01) level of significance which indicate that the relationship between the score of each statement and the total score of the dimension to which it belongs is significant. In other words, each statement was strongly related to the dimension to which it belongs.

Second, for verifying structural validity of the scale, correlation coefficients between the scores of each dimension and the total score of the scale were estimated. The results were as follows:

Table 10: Values of correlation coefficients between the dimensions and the total score of the scale



Dimensions	Correlation Coefficient	Sig
1 st Feelings	0.775	0.01
2 nd Thoughts and beliefs	0.775	0.01
3 rd Taken actions	0.827	0.01

Results in table 10 indicate that correlation coefficients were positive and statistically significant at (0.01) level. These results confirm that the Attitude towards PBL scale had a high degree of internal consistency.

Reliability of the Attitude towards PBL Scale:

Reliability of the scale was calculated using Cronbach's Alpha method, which is based on calculating the variance in the items of the scale, through which the extent of correlation between the scale items to each other, and the correlation between each item with the total score of the scale is illustrated. Results were as illustrated in the following table:

Table 11: Cronbach's Alpha Reliability Coefficient for the Attitude towards PBL Scale

Scale	N of Items	Cronbach's Alpha
Total	20	0.865

The reliability coefficient value of the whole scale was (0.865) which is a good value for reliability ($0.9 > \alpha \geq 0.8$). This implied that the scale was reliable and suited the purposes of the research. Hence, the scale was ready in its final version for administration in the current research (see Appendix C)

Data Collection:

Before applying the treatment, the researcher administered both the 21st Century Skills Assessment Inventory and the Attitude towards PBL Scale to both the experimental and control groups to make sure that the two groups were equivalent. The achievement test was not administered to either group as the course had not been studied before by either of them. A "t" test for independent groups

was used for comparing the means of the students' scores on the study tools. Table 12 shows the results of the pre administration of the 21st Century Skills Assessment Inventory.

Table 12: *t* values for difference in means of experimental and control groups on the pre- administration of the 21st Century Skills Assessment Inventory.

Dimensions	Groups	N	Mean	Std. Deviation	T Value	df	Sig
a. Collaboration	Experimental	115	14.19	2.53	0.739	228	Not Sig at 0.05
	Control	115	13.95	2.467			
b. Communication	Experimental	115	14.12	2.169	0.448	228	Not Sig at 0.05
	Control	115	13.99	2.25			
c. Critical thinking	Experimental	115	12.55	0.901	1.266	228	Not Sig at 0.05
	Control	115	12.70	0.973			
d. Creativity	Experimental	115	16.43	3.676	0.63	228	Not Sig at 0.05
	Control	115	16.74	3.855			
Total	Experimental	115	57.29	6.729	0.106	228	Not Sig at 0.05
	Control	115	57.38	6.926			

Results in table 12 indicate that there was no statistically significant difference between the mean scores of the two groups on the 21st Century Skills Assessment Inventory, which meant that the two groups were equivalent in their level in these skills.

Table 13 illustrates the results of the pre- administration of the Attitude towards PBL scale.

Table 13: *t* values for difference in means of experimental and control groups on the pre- administration of the Attitude towards PBL Scale

Dimensions	Groups	N	Mean	Std. Deviation	T Value	df	Sig
1	Experimental	115	10.88	2.340	1.76	228	Not Sig at 0.05
	Control	115	10.32	2.455			

Dimensions	Groups	N	Mean	Std. Deviation	T Value	df	Sig
2	Experimental	115	10.96	2.036	0.188	228	Not Sig at 0.05
	Control	115	10.90	2.16			
3	Experimental	115	12.35	0.761	0.173	228	Not Sig at 0.05
	Control	115	12.37	0.765			
Total	Experimental	115	34.18	2.928	1.571	228	Not Sig at 0.05
	Control	115	33.59	2.778			

Results in table 13 indicate that there was no statistically significant difference between the mean scores of the two groups on the Attitude towards PBL scale; which meant that the two groups were equivalent in their attitudes towards PBL before the treatment.

The Treatment

Aim of the treatment:

The current treatment aimed at developing the 21st Century Skills- the 4 Cs, academic achievement, and the attitude towards PBL of Gen Z junior English major student teachers. To achieve that aim, hybrid collaborative PBL approach was utilized within the course.

Objectives of the treatment:

By the end of the proposed treatment, students should be able to:

- 1- Apply the steps of project- based learning in manipulating topics of the special needs course.
- 2- Attain high levels of learning and academic achievement in relation to the studied course.
- 3- Master the 4Cs; collaboration, communication, critical thinking and creativity of the 21st century skills.
- 4- Develop positive attitudes towards PBL.

Designing the hybrid collaborative project-based course



Third year English major student teachers at the sixth semester of their four-year teacher education program study a course entitled “Methods of Teaching EFL to Special Needs Students”. The course handles various learning difficulties and impairments and how to diagnose and deal with them in the EFL classroom. It also relates all the difficulties and impairments to the inclusive classroom. Actually, the course handles these difficulties in a theoretical way, giving examples every now and then for students to remember.

The course was restructured to integrate hybrid PBL in a way that involved students in various tasks and activities that deepened their understanding of the issues related to teaching English to special educational needs students. They worked in teams of their own choice consisting of 10 to 15 student teachers. Each team was asked to select a learning difficulty or impairment to develop a project that consisted of PowerPoint Presentation, a poster and two or more practical activities to be used in teaching EFL to the special need students.

On one hand, face-to-face lectures involved introducing the course; its learning outcomes, learning difficulties included as a content, introduction to the hybrid PBL approach and its steps. The researcher gave the experimental group a thorough idea about the approach and how the course would proceed. On the other hand, online lectures or meetings were held through Zoom application where teams presented their PowerPoint presentations, received feedback to their presentations, asked for clarification or help, shared peer feedback and suggestions of improvement for the presentations.

The stages of project-based learning approach were applied throughout the course following the ten-step format: Step 1: Students and teacher agree on a theme for the project, Step 2:



Students and teacher determine the final outcome of the project, Step 3: Students and teacher structure the project, Step 4: Teacher prepares students for the demands of information gathering, Step 5: Students gather information, Step 6: Teacher prepares students to compile and analyze data, Step 7: Students compile and analyze information, Step 8: Teacher prepares students for the language demands of the final activity, Step 9: Students present the final product, and Step 10: Students evaluate the project (Lam, 2011).

The students went through all the main stages of project design. The project was a real opportunity for the students to apply the knowledge and skills they acquired in the course. Their projects were displayed in a project exhibition attended by the Faculty vice dean for student affairs, some interested faculty members and student teachers (For exhibition photos, see Appendix D).

Students were assessed through the 21st Century skills Assessment Inventory, a final achievement test and an Attitude towards PBL Scale.

Results:

Testing the first hypothesis:

The first hypothesis stated that “There is a statistically significant difference between the mean scores of the experimental and control group students on the post- administration of the 21st Century Skills Assessment Inventory in favor of the experimental group”. In order to verify the first hypothesis, the researcher used "t" test for independent groups to identify the significance of differences between the mean scores of the experimental and control groups students on the post- administration of the 21st Century Skills Inventory. The following table illustrates (t) values and their statistical significance.

Table 14: The difference between the experimental and control groups on the post-administration of the 21st Century Skills Assessment Inventory

Dimensions	Groups	N	Mean	Std. Deviation	T Value	df	Sig
Collaboration	Experimental	115	56.01	1.442	61.32	228	0.01
	Control	115	31.50	4.036			
Communication	Experimental	115	52.77	2.330	51.9	228	0.01
	Control	115	33.44	3.242			
Critical thinking	Experimental	115	41.76	0.854	38.88	228	0.01
	Control	115	22.78	1.19			
Creativity	Experimental	115	52.66	2.797	43.38	228	0.01
	Control	115	33.50	3.824			
Total	Experimental	115	203.19	4.527	101.6	228	0.01
	Control	115	121.23	7.372			

It is clear that there is a statistically significant difference between the mean scores of the experimental and control groups students on the post- administration of the 21st Century Skills Assessment Inventory in favor of the experimental group. The mean scores ranged between (41.76) and (56.01) for the experimental group and between (22.78) and (33.50) for the control group. The values of "t" were statistically significant at (0.01) level of significance in favor of the experimental group, both for the total score of the inventory (t= 101.6) and the scores of the component four dimensions (t value ranged between 38.88 and 61.32). Thus, the first hypothesis was accepted.

Hypothesis two stated that “There is a statistically significant difference between the mean scores of the experimental group students on the pre- and post- administrations of the 21st Century Skills Assessment Inventory in favor of the post- administration.

In order to test the second hypothesis, the researcher used "t" test for dependent groups to identify the significance of differences between the mean scores of the experimental group students on the

pre- and post- administrations of the 21st Century Skills Assessment Inventory. The following table illustrates (t) values and their statistical significance.

Table 15: "t" and (η^2) for the difference between the pre- and post-administrations of the 21st Century Skills Assessment Inventory to the experimental group

Dimensions	Measurement	N	Mean	Std. Deviation	T Value	df	Sig	(η^2)
Collaboration	Pre	115	14.19	2.53	145.1	114	0.01	0.995
	Post		56.01	1.442				
Communication	Pre	115	14.12	2.169	126.97	114	0.01	0.993
	Post		52.77	2.330				
Critical thinking	Pre	115	12.55	0.901	235.9	114	0.01	0.998
	Post		41.76	0.854				
Creativity	Pre	115	16.43	3.676	92.94	114	0.01	0.987
	Post		52.66	2.797				
Total	Pre	115	57.29	6.729	193.5	114	0.01	0.997
	Post		203.19	4.527				

Results in table 15 clarify that there is a statistically significant difference between the mean scores of the experimental group students on the pre- and post- administrations of the 21st Century Skills Assessment Inventory in favor of the post one. Mean scores of the post- administration ranged between ($41.76 \leq M \leq 56.01$) for the component dimensions and was (203.19) for the total score on the post- administration of the test. The values of "t" ranged between ($92.94 \leq t \leq 235.9$) and was (193.5) for the total score. All these values are statistically significant at (0.01) level; a result that indicates that the hybrid collaborative PBL course was effective in developing the targeted 4Cs skills. Consequently, the second hypothesis was accepted.

To examine the impact of the proposed treatment; i.e. the hybrid collaborative PBL course on enhancing 21st Century Skills of Gen Z junior English major student teachers, the effect size of the proposed treatment was estimated through comparing the mean

scores of experimental group students on the pre- and post-administrations of the 21st Century Skills Inventory using (η^2). Statistics in table 15 illustrate that the effect size of the proposed treatment on the 4 Cs skills as a whole was (0.997), which is a high ratio where the effect ratio should equal or surpass a value of (0.14). These statistics can be interpreted that (99.7%) of variance in performance of the students in their 4Cs skills as a whole can be attributed to the effect of implementing the proposed treatment. Concerning each of the 4Cs subskills, the effect ratio ranged between (0.987 and 0.998) which is considered a high effect as well. An interpretation for these statistics can be interpreted that a percentage that ranged between 98.7% and 99.8% of variance in students' performance in relation to their 21st Century Skills; the 4Cs can be attributed to the effect of implementing the hybrid collaborative PBL based course.

Hypothesis three stated that “There would be a statistically significant difference between the mean scores of the experimental and control group students on the post- administration of the academic achievement test on the project-based course in favor of the experimental group”. The achievement test was only post-administered to the experimental and the control groups because they did not study the PBL- based course before. In order to verify the third hypothesis, the researcher used "**t**" test for independent groups to identify the significance of differences between the mean scores of the experimental and control groups students on the post-administration of the achievement test. The following table illustrates (t) values and their statistical significance.

Table 16: "t" and its significance for the difference between the experimental and control groups on the post-administration of the achievement test

Levels	Groups	N	Mean	Std. Deviation	T Value	df	Sig
Remembering	Experimental	115	5.23	0.501	2.198	228	0.05
	Control	115	5.07	0.631			
Understanding	Experimental	115	5.25	0.493	4.704	228	0.01
	Control	115	4.87	0.72			
Applying	Experimental	115	3.80	0.402	37.08	228	0.01
	Control	115	1.61	0.49			
Higher- order levels	Experimental	115	50.17	0.868	85.28	228	0.01
	Control	115	39.82	0.97			
Total	Experimental	115	64.45	1.306	63.26	228	0.01
	Control	115	51.37	1.793			

It is clear that there is a statistically significant difference between the mean scores of the experimental and control groups students on the post- administration of the achievement test in favor of the experimental group. The mean score for the test was (64.45) for the experimental group and (51.37) for the control group. While the difference in means was not so great, the values of "t" were statistically significant at (0.01) level of significance in favor of the experimental group, both for the total score of the test ($t= 63.26$) and the scores of three out of four component levels; understanding, applying, and higher- order levels, while the remembering level was significant at 0.05 level of significance. Thus, the third hypothesis was accepted.

The fourth hypothesis stated that "There would be a statistically significant difference between the mean scores of the experimental and control group students on the post- administration of the Attitude towards PBL Scale in favor of the experimental group". In order to verify this hypothesis, the researcher used "t" test for independent groups to identify the significance of differences between the mean scores of the experimental and control groups students on the post- administration of the attitude scale. The following table illustrates (t) values and their statistical significance.

Table 17: "t" and its significance for the difference between the experimental and control groups on the post-administration of the Attitude towards PBL scale

Dimensions	Groups	N	Mean	Std. Deviation	T Value	df	Sig
Feelings	Experimental	115	27.37	0.995	29.91	228	0.01
	Control	115	17.78	3.292			
Thoughts and Beliefs	Experimental	115	28.27	1.391	28.524	228	0.01
	Control	115	18.22	3.514			
Taken Actions within PBL	Experimental	115	36.22	1.248	30.77	228	0.01
	Control	115	25.23	3.618			
Total	Experimental	115	91.86	2.328	41.55	228	0.01
	Control	115	61.23	7.555			

It is clear that there is a statistically significant difference between the mean scores of the experimental and control groups students on the post- administration of the Attitude towards PBL scale in favor of the experimental group. The mean score for the scale was (91.86) for the experimental group and (61.23) for the control group. The values of "t" were statistically significant at (0.01) level of significance in favor of the experimental group, both for the total score of the scale and the scores of the three component dimensions. Thus, the fourth hypothesis was accepted.

The fifth hypothesis stated that "There would be a statistically significant difference between the mean scores of the experimental group students on the pre- and post- administrations of the Attitude towards PBL Scale in favor of the post one". To verify this hypothesis, the researcher used "t" test for dependent groups to determine the significance of differences between the mean scores of the experimental group students on the pre- and post-administrations of the Attitude towards PBL scale. The following table illustrates these results.

Table 18: "t" and " η^2 " for the difference between the pre- and post-administrations of Attitude towards PBL scale to the experimental group

Dimensions	Measurement	N	Mean	Std. Deviation	T Value	df	Sig	(η^2)
Feelings	Pre	115	10.88	2.34	69.77	114	0.01	0.977
	Post		27.37	0.995				
Thoughts and Beliefs	Pre	115	10.96	2.036	77.71	114	0.01	0.982
	Post		28.27	1.391				
Taken Actions within PBL	Pre	115	12.35	0.761	183.8	114	0.01	0.996
	Post		36.22	1.248				
Total	Pre	115	34.18	2.928	181.29	114	0.01	0.996
	Post		91.86	2.328				

Results in table 18 clarify that there is a statistically significant difference between the mean scores of the experimental group students on the pre- and post- administrations of the Attitude towards PBL scale in favor of the post one. Mean score of the post-administration was (91.86) for the total score of the scale; which is a high value when compared to the Mean of the pre- administration (34.18). The values of "t" were statistically significant at (0.01) level; a result that indicates that the course was effective in developing a positive attitude towards PBL for the targeted sample. Consequently, the fifth hypothesis was accepted.

Discussion:

The current research attempted to investigate the effect of a hybrid collaborative PBL course on 21st Century Skills, academic achievement and attitude towards PBL among Gen Z junior English major student teachers at the faculty of Education. The results revealed a statistically significant difference at (0.01) level between the mean scores of the experimental and control groups on the post-administrations of the 21st Century Skills Assessment Inventory, the academic achievement test and the Attitude towards PBL scale in favor of the experimental group. This means that English major student teachers' 4Cs skills, academic achievement, and attitude towards PBL improved as a result of applying the hybrid collaborative PBL course.



Moreover, there was a statistically significant difference between the mean scores of the experimental group on the pre- and post-administrations of the 21st Century Skills Assessment Inventory and the Attitude towards PBL scale in favor of the post- administration. Consequently, this indicates that the proposed treatment was effective in developing the 21st Century skills; namely, collaboration, communication, critical thinking, creativity, and a positive attitude towards PBL.

The present study provides evidence for the effectiveness of using hybrid Project- based learning approach in developing English major student teachers' 21st Century Skills, academic achievement and their positive attitudes towards PBL. The findings of the current study corroborate the previous relevant studies that investigated the effect of using PBL approach in general on developing language skills such as writing as proved by Thitivesa and Essien (2013), Giawa (2022), Ilham (2022); EFL productive skills such as Rochmahwati (2016), and Astawa, Artini and Nitiasih (2017); and language proficiency improvement in general such as Imtiaz and Asif (2012), Arabloo et al. (2021), and Yaprak (2022). Moreover, it substantiates the results reached by other similar studies that PBL had a significant effect on improvement of 21st century skills (4Cs) such as Vicheanpant and Ruenglerpanyakul (2012), Bani-Hamad and Abdullah (2019), Badr (2021), Haniah et al. (2021), Sari and Prasetyo (2021), and Al-Bahadli et al. (2023). Finally, in relation to improving learning outcomes of student teachers, both studies of Al- Busaidi et al. (2021) and Busayairi et al. (2023) confirmed the effectiveness of PBL as a tool for student teachers' professional development and as an important tool of synergy between theoretical and practical aspects of preservice teacher education.

The achieved results could be attributed to the benefits of incorporating the hybrid collaborative PBL approach in teaching the



targeted course, which in fact has a plethora of features that allow for more interaction, collaboration, critical thinking, and creativity on the part of English major student teachers. These features unite the advantages of hybrid and collaborative learning where students can meet anywhere and at any time that suits them and allow for more opportunities for creative thinking. PBL aids both teachers and students to achieve high levels of performance in the targeted knowledge and skills because it increases students' activeness and motivation during the learning process and enables them to apply the knowledge, they acquired in a way that achieves maximum benefit of that theoretical knowledge.

Generally speaking, Gen Z English major students who participated in the research expressed their satisfaction with the hybrid collaborative PBL course and its features; they found it different, encouraging, interesting, and compatible with their preferred learning styles and ways of constructing knowledge. They were especially interested in the idea of collaborating within their teams to provide evidence for their full comprehension of the content provided. They formed the teams according to their own choice, selected a difficulty of their interest, and selected the way they can illustrate their understanding through. Further, they were satisfied with the effort they exerted within the framework of the collaborative projects.

Project- based learning is a constructive teaching- learning strategy that can promote active and deep learning by involving students in investigating real-world issues in a collaborative environment that builds 21st century success skills such as collaboration, communication, critical thinking, and creativity. The major role of feedback provided by the instructor and by students to each other within and among the teams helped them to gain new insight into doing their projects. They believed that feedback is a vital part of the implementation of PBL. The role of the instructor as a facilitator, guide, and consultant contributed to the success of the course where students find fruitful guidance throughout the process of



working on their projects. Especially for the face-to-face component of the hybrid course, GenZ student teachers changed their attitudes towards it from the beginning till the end of the duration of the treatment. At the beginning of the treatment, students were reluctant to share and participate in the discussions and lectures held directly for the purpose of clarifying any misconceptions related to the content of the course. However, by the end of the treatment, they were more interested in participation and collaboration to have the best project. The result showed sharing activities and feedback creates a positive atmosphere in the classroom, promotes better teacher-student relationships, and further enhances proactive learning attitudes.

Conclusion:

In conclusion, 21st century skills are no longer a luxury requirement for current and coming generations. They should be nurtured in them hand in hand with academic competence. Gen Z English major student teachers are techno-savvy: they are significantly adaptable to innovation trends and immediately use emerging and up-to-date technologies, as well as info-communication devices both in their studies and work. This implies that faculty members should change their traditional teaching methods to include modern technologies and approaches that meet the needs of those GenZ students.

If PBL is used effectively, it will encourage students to learn deeply and relatively permanently. PBL also has the potential to change students' lives, especially those who are least likely to have access to other students. It proves that it has a direct effect on EFL college students' communication. The interaction that resulted during presenting the projects and receiving feedback stimulated the students to ask and discuss which in turn affected their overall performance, achievement, and attitudes.



Recommendations:

Based on the results of the current study, the following recommendations are suggested:

1. There should be much attention directed to orienting university students in collaborative project- based learning as it is a convenient teaching- learning approach in the current digital era.
2. Teacher training programs should implement PBL to produce creative teachers who are able to think critically, communicate effectively, and work collaboratively.
3. Digital competence is one of the competencies university teachers need if they wish to use modern techniques embedded in their lessons and to cope up with their Gen Z students' needs.
4. Teachers need to allow students to explore their skills in Project-based learning and encourage students to have a better understanding of it. Teachers' beliefs and commitment are essential for the effective implementation of PBL for the students.
5. Teachers must plan and create detailed PBL lesson plans and choose appropriate techniques and tools to enhance PBL. They should set up rubrics and portfolios for assessment.

Suggestions for further research:

In the light of results and recommendations proposed by the current research, the following research topics are suggested:

- The effectiveness of using hybrid PBL in developing EFL academic writing skills of English major students at faculties of Education.



مجلة كلية التربية. جامعة طنطا
ISSN (Print):- 1110-1237
ISSN (Online):- 2735-3761
<https://mkmgt.journals.ekb.eg>
المجلد (89) يناير 2023 م



-
- The effect of implementing the PBL in improving critical reading and creative writing skills of EFL student teachers.
 - A proposed training program based on digital tools to develop 21st century skills and self- regulation of secondary stage students.



References:

- Adamson, M. A., Chen, H., Kackley, R., & Micheal, A. (2018). For the Love of the Game: Game- Versus Lecture-Based Learning With Generation Z Patients. *Journal of Psychosocial Nursing and Mental Health Services*, 56, 29–36. <https://doi.org/10.3928/02793695-20171027-03>.
- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52, 27–58.
- Al-Bahadli, Kh.; Al-Obaydi, L. & Pikhart, M. (2023). The Impact of the Online Project-Based Learning on Students' Communication, Engagement, Motivation, and Academic Achievement. *Psycholinguistics, Special Issue*, 33 (2), 217–237.
- Albiladi, W. S., & Alshareef, K. K. (2019). Blended learning in English teaching and learning: A review of the current literature. *Journal of Language Teaching and Research*, 10(2), 232. DOI:10.17507/jltr.1002.03
- Al-Busaidi, S.& Al-Seyabi, F. (2021). Project-based Learning as a Tool for Student-Teachers' Professional Development: A Study in an Omani EFL Teacher Education Program. *International Journal of Learning, Teaching and Educational Research*, 20 (4), 116-136.
- American Association of Colleges of Teacher Education and the Partnership for 21st Century Skills (2010). 21st century knowledge and skills in educator preparation. Retrieved April 4, 2019, from: http://www.p21.org/storage/documents/aacte_p21_whitepaper2010.pdf
- Arabloo, P., Hemmati, F., Rouhi, A., Khodabandeh, F. (2021). The Effect of Technology-aided Project-based Learning on EFL Learners' Language Proficiency and Self-Regulation. *Foreign Language Research Journal*, 11 (2), 121-143.
- Astawa, N; Artini, L.& Nitiasih, P. (2017). Project-based Learning Activities and EFL Students' Productive Skills in English. *Journal of Language Teaching and Research*, 8 (6), 1147-1155.
- Attard, A., Di Lorio, E., Geven, K. and Santa, R. (2010). Student-centered learning –Toolkit for students, staff and higher education institutions. Brussels: European Students Union. <http://www.esib.org/index.php/Publications>
- Badr, B. (2021). The Effect of a Proposed Blended Project-Based Learning Program on Developing the 4Cs Skills for Secondary Stage Students. *Journal of Faculty of Education, Sohag University*, Part 2-(92), 50-107.
- Baker, C. (1992). *Attitudes and Language*. Clevedon: Multilingual Matters
- Bani-Hamad, A. M. H., & Abdullah, A. H. (2019). The Effect of Project Based Learning to Improve the 21st Century Skills among Emirati



- Secondary Students. *International Journal of Academic Research in Business and Social Sciences*, 9(12), 546–559.
- Barahmeh, H. M., Bani-Hamad, A. M., & Barahmeh, N. M. (2017). The Effect of Fermi questions in the Development of Science Processes Skills in Physics among Jordanian Ninth Graders, *Journal of Education and Practice*, 8(3) 186-194.
- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House*, 83(2), 39-43.
- Beth, C. (2016, April 13). *The 4Cs of 21st Century Skills*. SimpleK12. <https://www.simplek12.com/learning-theories-strategies/4cs-21st-century-skills/>
- Betz, C. (Ed.), (2019). Generations X, Y, and Z. *Journal of Pediatric Nursing*, 44, A7–A8.
- Binkley, M., Erstad, O., Herman, J., Raizen, S., & Ripley, M. (with M. Rumble). (2010). *Defining 21st century skills and assessments (Draft White Paper1)*. Melbourne, Australia: Assessment and Teaching of 21st Century Skills.
- Bock, A., Kniha, K., Goloborodko, E., Lemos, M., Rittich, A.B., M'ohlhenrich, S.C., Rafai, N., H'olzle, F., Modabber, A. (2021). Effectiveness of face-to-face, blended and e-learning in teaching the application of local anaesthesia: a randomised study. *BMC Med. Educ.* 21, 1–8.
- Bohner, G., and N. Dickel. 2011. 'Attitudes and Attitude Change.' *Annual Review of Psychology*. 62: 391–417.
- Boss, S., & Krauss, J. (2014). *Reinventing project-based learning: Your field guide to real-world projects in the digital age*. International Society for Technology in Education.
- Bourn, D. (2018). *Understanding global skills for 21st century professions*. Springer.
- Busyairi, A., Harjono, A.& Zuhdi, M. (2023). The Effect of Online-Project Based Learning on Learning Outcomes of Pre-Service Physics Teachers. *Jurnal Ilmiah Profesi Pendidikan*, 8 (1b): 880 – 885.
- Caine, R. N. (2011). *Natural learning for a connected world: Education, technology, and the human brain*. Teachers College Press
- Carter, T. (2018). Preparing Generation Z for the Teaching Profession. *SRATE Journal*, 27(1).
- Chicca, J.& Shellenbarger, T. (2018). Connecting with Generation Z: Approaches in Nursing Education. *Teaching and Learning in Nursing*, 13, 180–184.
- Dimmitt, N. (2017). The Power of Project Based Learning: Experiential Education to Develop Critical Thinking Skills for University Students. In *CBU International Conference Proceedings*, 5, 575-579.



- Dziuban, C., Hartman, J., & Moskal, P. (2004). Blended learning. *EDUCAUSE Center for Applied Research Bulletin*, 7, 1-12.
- Eagly, A.H. & Chaiken, S. (1993). *The psychology of attitudes*, Fort Worth, TX: Harcourt Brace Jovanovich.
- Eagly, A. & Chaiken, S. (2007). 'The Advantages of an Inclusive Definition of Attitude.' *Social Cognition*, 25 (5): 582–602.
- English, M., & Kitsantas, A. (2013). Supporting student self-regulated learning in problem-and project-based learning. *Interdisciplinary journal of problem-based learning*, 7(2), 6.
- Essien, A. (2018). The effects of project-based learning on students' English language ability. The 2018 International Academic Research Conference in Vienna, pp. 438- 443.
- Fandiño, Y. J. (2013). 21st century skills and the English foreign language classroom: A call for more awareness in Colombia. *GIST Education and Learning Research Journal*, 7, 190–208.
- Gardner, H. (1999). Are there additional intelligences? The case for naturalist, spiritual, and existential intelligences. In J. Kane (Ed.), *Education, information, and transformation: Essays on learning and thinking* (pp. 120–137). Prentice Hall.
- Gardner, R. C., Masgoret, A.-M., Tennant, J., and Mihic., L. (2004). 'Integrative Motivation: Changes during a Year-Long Intermediate-Level Language Course.' *Language Learning*, 54 (1): 1–34.
- Garrison, G., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education, *The Internet and Higher Education*, 7, 95 -105.
- Geisinger, K. F. (2016). 21st Century Skills: What Are They and How Do We Assess Them? *Applied Measurement in Education*, 29(4), 245–249.
- Giawa, I. (2022). The Effect of Project Based Learning and Problem Based Learning in Writing Narrative Text. *International Journal of Educational Research Excellence (IJERE)*, 1 (1), 34: 38
- Gil, P., & Garcia, F. (2011). Blended learning revisited: How it brought engagement and interaction into and beyond the classroom. In Kitchenham, A. (Eds.), *Blended learning across disciplines: models for implementation*, (pp. 58-72).
- Han, S. (2017). Korean students' attitudes toward STEM project-based learning and major selection. *Educational Sciences: Theory & Practice*, 17, 529–548.
- Haniah, A. U., Ngadiso, N., & Setyaningsih, E. (2021). Students' Perception on the Implementation of Online Project-Based Learning in Teaching 4Cs. *Indonesian Journal of English Language Teaching and Applied Linguistics*, 6 (1), 123-140



- Haryatti, S. (2017). EFL Students' Perspectives of Applying CALL through Project-Based Learning. *UHAMKA International Conference on ELT and CALL (UICELL)* (pp. 23-24).
- Howe, N. (2014, October). *Introducing the Homeland Generation*. Retrieved from <https://www.forbes.com/sites/neilhowe/2014/10/27/introducing-thehomeland-generation-part-1-of-2/#356f31b62bd6>
- Huang, D., Leon, S., Hodson, C., La Torre, D., Obregon, N., & Rivera, G. (2010). Preparing Students for the 21st Century: Exploring the Effect of Afterschool Participation on Students' Collaboration Skills, Oral Communication Skills, and Self-Efficacy. CRESST Report 777. *National Center for Research on Evaluation, Standards, and Student Testing (CRESST)*.
- Ilham, U. (2022). Implementing project-based learning for EFL students' writing achievement at the tertiary level. *English Review: Journal of English Education*, 10 (3), 1003-1012.
- Imtiaz, S. & Asif, S. I. (2012). " I almost learnt to learn": Promoting Learner's Autonomy through Project Based Learning in Access Classrooms. *Language in India* 12.1, 24-45.
- Islam, M.; Halim, S.& Halim, T. (2022). Implementation of project-based learning (pbl) in teaching skills courses at the tertiary level: how effective is it for all types of learners?. *Journal of Tianjin University Science and Technology*, 55 (07), 251- 262.
- Jacobsen, M. (2011). A Case Study of a Blended Doctoral Program in Educational Technology. In A. Kitchenham (Ed.), *Blended learning across disciplines: models for implementation*. (pp. 58-72).
- Jain, V. (2014). 3d Model of attitude. *International Journal of Advanced Research in Management and Social Sciences*, 3 (3).
- Jia, J., Chen, Y., Ding, Z., & Ruan, M. (2012). Effects of a vocabulary acquisition and assessment system on students' performance in a blended learning class for English subject. *Computers & education*, 58(1), 63-76.
- Kember, D. (2009). Promoting Student-Centered Forms of Learning across an Entire University. *Higher Education*, 58, 1-13.
- Knowlton, D. (2003). Preparing students for educated living: Virtues of problem-based Learning across the higher education curriculum. *New Directions for Teaching and Learning*, 24(95), 5-12.
- Komol, T., & Suwanphathama, S. (2020). Students' Perceptions and Attitudes Toward the Use of Communicative Language Teaching (CLT) to Improve English Listening and Speaking Skills. *English Language and Literature Studies*, 10, 40.



- Kulikovskikh, I., Prokhorov, S., & Suchkova, S. (2017). Promoting collaborative learning through regulation of guessing in clickers. *Computers in Human Behavior*, 75, 81–91.
- Lam, N. T. V. (2011). Project-based learning in teaching English as a foreign language VNU. *Journal of Science, Foreign Languages*, 27, 140-146.
- Larmer, J., Mergendoller, J., & Boss, S. (2015). *Setting the standard for project-based learning*. Alexandria, VA: ASCD.
- Mantle-Bromley, C. (1995). Positive Attitudes and Realistic Beliefs: Links to Proficiency. *The Modern Language Journal*, 79, 372-386.
- Markham, T., Mergendoller, J., & Ravitz, J. (2003). *Project based learning handbook*. New York: Buck Institute for Education.
- Miyazoe, T., & Anderson, T. (2010). Learning outcomes and students' perceptions of online writing: Simultaneous implementation of a forum, blog, and wiki in an EFL blended learning setting. *System*, 38, 185-199.
- Mohr, K. & Mohr, E. (2017). Understanding Generation Z Students to Promote a Contemporary Learning Environment. *Journal on Empowering Teaching Excellence*, 1(1) , Article 9.
- Nassir, S. (2014). The Effectiveness of Project-based Learning Strategy on Ninth Graders' Achievement Level and their Attitude towards English in Governmental Schools -North Governorate (Master Thesis). Gaza: The Islamic University.
- National Research Council. (2013). Education for life and work: Developing transferable knowledge and skills in the 21st century. National Academies Press.
- Noor-UI-Amin, S. (2013). An effective use of ICT for education and learning by drawing on worldwide knowledge, research, and experience: ICT as a change agent for education. *Scholarly Journal of Education*, 2(4), 38-45.
- Oakley, G. (2016). From Diffusion to Explosion: Blended Learning at the University of Western Australia. In C. P. Lim & L. Wangs (Eds.), *Blended learning for quality higher education*. Bangkok: UNESCO/HKILE.
- Oweis, T. I. (2018). Effects of using a blended learning method on students' achievement and motivation to learn English in Jordan: A Pilot Case Study. *Education Research International*, 1-7.
- Pacific Policy Research Center (2010). *21st century skills for students and teachers*. Honolulu: Kamehameha Schools, Research & Evaluation Division. Retrieved April 12, 2019, from: http://www.ksbe.edu/assets/spi/pdfs/21_century_skills_full.pdf



- Partnership for 21st Century Skills. (2009). *The MILE guide: Milestones for improving learning & education*. Tucson, AZ: Author. Retrieved March 25, 2021, from: www.21stcenturyskills.org/documents/MILE_Guide_091101.pdf
- Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the Horizon*, 9(5), 1–6. Retrieved on December 26, 2018 from <http://libproxy.usc.edu/login?url=https://searchproquest.com.libproxy2.usc.edu/docview/214629645?accountid=14749>.
- Railsback, J. (2002). Project-Based Instruction: Creating Excitement for Learning. Northwest Regional Educational Lab., Portland, *ERIC Document Reproduction Service*, ED. 471708.
- Ravitz, J., Hixson, N., English, M., & Mergendoller, J. (2012). Using project based learning to teach 21 st century skills : Findings from a statewide initiative. *American Educational Research Association Conference, Vancouver, Canada*.
- Rochmahwati, P. (2016). Project-based learning to raise students' speaking ability: its' effect and implementation (a mix method research in speaking II subject at STAIN Ponorogo). *Kodifikasia*, 9(1), 199-222.
- Rochmawati, A., Wiyanto, & Ridlo, S. (2019). Analysis of 21th Century Skills of Student on Implementation Project Based Learning and Problem Posing Models in Science Learning. *Journal of Primary Education*, 9(1), 58–67.
- Santosa, M. H. (2017). Learning approaches of Indonesian EFL Gen Z students in a Flipped Learning context. *Journal on English as a Foreign Language*, 7(2), 183-208.
- Saxena, S. (2014). *How Do You Teach the 4Cs to Students: Creativity and Innovation? (Part - 1) - Creativity and Innovation*. EdtechReview. <https://edtechreview.in/trends-insights/insights/914-how-do-you-teach-the-4Cs-to-students-part-1-creativity-and-innovation>
- Seemiller, C. & Grace, M. (2016). *Generation Z goes to college*. San Francisco: Jossey-Bass.
- Shih, R. C. (2010). Blended learning using video-based blogs: Public speaking for English as a second language students. *Australasian Journal of Educational Technology*, 26(6), 883- 897.
- Schlee, R.; Eveland, V.& Harich, K. (2020). From Millinials to Gen Z: Changes in student attitudes about group projects. *Journal of Education for Business*, 59 (3).
- Shorey, S.; Chan, V.; Rajendran, P.& Ang, E. (2021). Learning styles, preferences and needs of generation Z healthcare students: Scoping review. *Nurse Education in Practice*, 57, 103247.
- Stjepić, A. Vukšić, M.& Suša Vugec, D. (2019). Digital Literacy of the Generation Z Students and Their Attitudes and Beliefs Towards ICT



- Knowledge and Skills, *International Journal Vallis Aurea*, 5 (1), 17-29.
- Stoller, F. (2006). Establishing a theoretical foundation for project-based learning in second and foreign language contexts. In G. H. Beckett, & P. C. Miller, Eds., *Project-based second and foreign language education: Past, present, and future* (pp. 19-40). Greenwich, CT: Information Age.
- Tella, J., Indoshi, F. C., & Othuon, L. A. (2010). Relationship between students' perspectives on the secondary school English curriculum and their academic achievement in Kenya. *Educational Research*, 1, 390–395.
- Thitivesa, D. & Essien, A. (2013). The Use of Project to Enhance Student Teachers' Writing Skills in a Rajabhat University. Conf Rec. ICBME'13 International Conference of Business, management and Economics, CH73000.
- Thomas, J. W. (2000). *A review of research on project-based learning*. California: The Autodesk Foundation.
- Tran, T.Q., & Tran, T.N. (2020). Attitudes toward the Use of Project-Based Learning: A Case Study of Vietnamese High School Students. *Journal of Language and Education*, 6(3), 140-152.
- Trilling, B., & Fadel, C. (2009). *21st Century Learning Skills*. San Francisco, CA: John Wiley & Sons.
- Van Roekel, D., & Association, N. E. (2014). Preparing 21st century students for a global society: an educator's guide to the "Four Cs.". *National Education Association*
- Vicheanpant, T., & Ruenglertpanyakul, W. (2012). Attitude about project-based learning and lecture based for develop communication skill. *European Journal of Social Sciences*, 28(4), 465-472.
- Wurdinger, S. D., Haar, J., Hugg, B., & Bezon, J. (2007). A qualitative study using project based learning in a mainstream middle school. *Improving Schools*, 10, 150–61.
- Yaparak, Z. (2022). The effects of project-based learning (PBL) in EFL context: General language development and personal empowerment. *Journal of Computer and Education Research*, 10 (20), 415-433. <https://doi.org/10.18009/jcer.1104483>
- Zhang, W., & Zhu, C. (2018). Comparing learning outcomes of blended learning and traditional face-to-face learning of university students in ESL courses. *International Journal on E-Learning*, 17(2), 251-273
- Zurita, G.; Hasbun, B.; Baloian, N. & Jerez, O. (2015) A Blended Learning Environment for Enhancing Meaningful Learning Using 21st Century Skills. In: Chen G., Kumar V., Kinshuk, Huang R., Kong S.



مجلة كلية التربية. جامعة طنطا
ISSN (Print):- 1110-1237
ISSN (Online):- 2735-3761
<https://mkmgt.journals.ekb.eg>
المجلد (89) يناير 2023 م



(Eds.), *Emerging issues in smart learning: Lecture notes in educational technology*. Springer, Berlin, Heidelberg