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Educational Technology to Enhance EFL Learners' Research Skills: The Case of Third-Year Students at Naama University Center, Algeria

Nadjia BOUSSEBHA
Department of foreign languages, Section: English
Ahmed Salhi University Center of Naama, Algeria
Email: boussebha@cuniv-naama.dz

Abstract
To cope with the spectacular progress of technology, university education in Algeria has placed a lot of emphasis on delivering instructions through the eLearning platform. This paper explores the usefulness of eLearning in improving the students' learning experiences to undertake research projects. No empirical studies have been conducted on the efficacy of online teaching research methodologies in Algerian EFL contexts. The current research tries to show and an in-depth look at the efficacy of teaching the *Research Techniques* module online. It attempts to answer the question: To what extent has the e-Learning platform been effective in teaching/learning research methods to Algerian EFL students? To this aim, the researcher's gleaning of data was from a questionnaire distributed to 86 third-year students of English in the department of foreign languages at Naama University Center and a semi-structured interview with three teachers from the same context. The findings reported that e-learning has influenced the educational process and positively affected students' knowledge construction and reflexivity. It has also increased their personal and empirical skills to conduct research projects despite some challenging features. This research will be of broad interest to EFL teachers willing to use eLearning in their methodology courses besides improving their teaching. The reported acceptability of eLearning might be utilized to influence policy and counter the traditional teaching methods used in Algerian institutions. Furthermore, although the finding is not generalizable, it does include features that instructors in other contexts may find valuable.
Keywords: Digital literacy, educational process, EFL students, e-learning platform, empirical skills, knowledge construction, research techniques

Introduction

It is widely acknowledged that the World Wide Web is one of the essential sources for instructors and students to receive and distribute information. The advent of new e-learning tools has resulted in sweeping reforms in the field of education in recent times. Universities have recently begun to embrace this pedagogical paradigm, exploring several e-learning approaches (Capogna, 2014). To prevent the Coronavirus, Algeria's Ministry of Higher Education and Scientific Research, like all governments and policymakers worldwide, directly requested universities to conduct online teaching and learning using regularly established eLearning platforms to ensure educational process continuity. For this purpose, it is essential that decision-makers must consider the need for financial and social support to successfully raise academic standards (A. Chelghoum & H. Chelghoum, 2020).

Employment of e-learning environments in line with physical classrooms stimulates students' thinking about underlying material and internal understanding. It may become a resource that fosters a greater level of reflection. Participants in the e-learning experience actively reflect, evaluate, and create knowledge using various strategies and tools, in contrast to the traditional educational process, which consists of a single environment and regards the student as a passive consumer of information.

Knowledge building is the focus of the learning methodology that blends the physical classroom style simultaneously with the online mode for creating a collaborative context. Constructing knowledge is based on the fact that learning doesn't happen in a straight line, on doing tasks in a way that makes sense in the *Context*, and on social negotiation (Jonassen, 2004). The teaching and learning community improves through embracing eLearning and the physical dimension of the classroom to develop collaborative strategies with various activities from both models. Engaging with eLearning avoids several problems, including anxiety and loss of interest in knowledge acquisition. E-learning is needed to promote active learning that encourages the production of new knowledge. Those elements are essential in the process of learning research methodologies.

Research methodology constitutes the foundation of academic inquiry. It is a required part of the Algerian EFL undergraduate curriculum. Courses in research methodology provide a ground for research projects. Furthermore, mastery of research procedures is an essential skill in higher education. It prepares students to conduct original research and to critically evaluate research findings.

At Naama University Center, *Research Techniques* is a module called by the administration *TTU*, which stands for *Techniques de Recherche Universitaires* in French. It is taught beside the basic modules strengthening the learners' English language skills and fluency in *Grammar, Oral/Written Comprehension and Expression*. The modules taught in the third-year License-Master-Doctorate (LMD) are *Literature, Civilization, Linguistics, Translation, Phonetics, Human and Social Sciences, ESP, Didactics,* and *French* in the first (L1) and second (L2) years. *Cognitive Psychology* is added to the former modules for the Third-year Level (L3). However, the *Research Technique* module is replaced by *Methodology, Teaching Methodologies and Communication* in Master First-Year Level (M1) and *Methodology* and *Educational Research* in Master Second-Year Level (M2).

In the same context, our students often struggle to understand and connect to research methodology courses despite the different strategies suggested by their teachers to reduce these challenges and improve the learning experience. In this sense, Tymoshchuk (2022), argues that e-

learning is a powerful and cutting-edge educational tool that may enhance teaching and learning. Thus, eLearning is intended to be one of the most influential and valuable instructional strategies in this context.

The current study investigates the effectiveness of an e-learning platform in teaching and learning research methods to third-year EFL students at Ahmed Salhi University Center in Naama, Algeria, during the academic year 2021–2022. During this time, Algeria was still struggling to recover from the pandemic caused by the coronavirus. As a result, a decision was made by the government that the number of in-person classes should be lowered and replaced with online sessions.

This research attempts to examine whether research lessons via eLearning have enhanced the various learners' skills. Furthermore, it aims to illustrate the instructors' perspectives on adopting an eLearning platform in the educational setting, as well as the difficulties they regularly face while teaching research methodologies. This work is significant in helping teachers address the drawbacks of teaching research methodologies via an e-learning platform. It is expected to remind decision-makers to consider *new mechanisms* (Ghounane, 2022) for encouraging students' massive adoption of eLearning. This paper aims to examine the efficacy of online courses in fostering EFL students' research abilities.

The researcher anticipated that this study would find answers to the following research questions.

- To what extent has the e-Learning platform been effective in the process of teaching/learning research techniques to third-year EFL students at Naama University Center?
- What are the EFL learners' abilities developed in the online courses?
- How does it affect the development of EFL learners' research abilities?
- What are the EFL teachers' impressions and the challenges they face regarding the use eLearning platform to teach research techniques?

The researcher structured this investigation in four steps. First, the present study endeavors to show the importance of technology in modern education. Second it intends to argue that teaching research methods need to be associated with the online mode. Third, the study recommends an online constructivist pedagogical approach to develop EFL learners' research skills and competencies. Finally, the study provides evidence that Students increase their research abilities with the use of online research methods courses.

Literature Review
Technology for Educational Pedagogy

The development of new technologies is providing significant nourishment for modern classroom practices. Modern teaching methods must be geared toward the needs of 21st-century students. The practical approach to raising academic standards is to encourage new forms of teaching (Naz & Murad, 2017). As the internet and various digital devices become more widely available, it is clear that online learning will increase in vitality and diversity in educational institutions. Students and teachers can interact from any location and anytime thanks to a digital learning platform that promotes independence and flexibility (Levy & Stockwell, 2006).

The importance of eLearning in the Algerian context has been the topic of much research conducted mainly during and after the coronavirus pandemic such as, to name few, Ghounane (2022), Kerras and Salhi (2021), Guemid and Maouche (2020), Boukhaloua and Djaileb (2022),

Guessar (2020), Benadla and Hadji (2021) Notwithstanding, the idea of teaching research methodologies using an e-learning platform has not been investigated up to this point. So far, there has been no study on the feasibility of employing an online learning mode to instruct research methods.

ELearning is a flexible and adaptable pedagogical open-source platform developed with the potential to create an effective learning environment for learners. It is primarily used to be constantly available for the digital allocation of courses and to maintain easy access to digital collections of documents. Lorenzi, MacKeogh and Fox (2004) referred to e-learning as the use of a wide range of web technologies to support knowledge acquisition. With such characteristics, if students are well equipped with digital devices, they will undoubtedly develop a familiarity with and experience with online courses. However, there is always a lack of digital materials in the learning community. In this sense, Benadla and Hadji (2021) opined that:

> No doubt E-learning may have enormous advantages, but its downsides are ignored too, especially in Algeria. Information-processing depends on technology such as the Internet and computers, to which students may not have access. Often interruptions and other system errors may appear during courses. (p. 63)

The individual social and economic situations are undoubtedly the significant factors that facilitate the learners' engagement in online education practices. Likewise, Bin Herzallah (2021) emphasized the co-existence of eLearning drawbacks with its advantages. He delineated that "the Algerian Ministry of Higher Education has spent considerable money on the success of e-learning. It has encountered several failures, but the recent results indicate that there are real signs of E-learning on the ground" (p. 89).

Moreover, Rahim and Chandran (2021) argued that "e-learning is considered an applicable approach in EFL education that enhances reliable language practices, motivates the learners and teachers, provides the opportunity of anywhere and anytime education, and reduces the students' anxiety and costs" (p. 63). Furthermore, it is now possible to describe elearning as developing skills using a variety of available technology choices ranging from reading content pages that are static to interacting in virtual worlds (Rock, Coventry, Morgan, & Loi, 2016).

A user's ability to function in today's digital world depends on the mastery of a range of skills and knowledge known collectively as *digital literacy* (Leaning, 2019). It refers to the individual's mastery of using a computer and his understanding and ability to deal with the multiple input and output forms of information. Recent research in the field of English as a Foreign Language (EFL) education has addressed a variety of issues, including teachers' abilities in digital literacy and how they pertain to their practices (Jiang, Yu, & Zhao, 2021).

In addition, in shifting from face-to-face to online education, teachers needed to modify the traditional classroom courses for online delivery. Otherwise, the static instructional mode for different environments would place less value on their engagement. According to Lytras, Sarirete and Damiani (2020), the job of an educator is hanging from that of a knowledge provider to that of a co-partner to accomplish a substantial transfer of information. To address this need, several new types of educational facilities were developed. In this context, Algerian teachers scrambled to turn the content of their classroom lessons into virtual/online courses and to improve their digital skills as a crucial feature for professional development.

Views on Maintaining a Balanced Perspective

The advantages and disadvantages of online education for EFL students are becoming more

important to study. Al-Khatib (2009) proposed that the integration of information and communication technologies has to include the development of new frameworks that consider the environment in which the students are learning and their simultaneous experiences of practicing and reflecting on what they have learned.

Furthermore, Al-Samiri (2021) looked at over 40 articles that discussed the pros and cons of using the internet to teach English to non-native speakers throughout the Saudi context during the outbreak of the COVID-19 virus. She found that online courses might assist timid and hesitant students becoming much more effective, yet, online classrooms are deemed a "less-than-optimal learning environment" (p. 150), which impacts the learners' engagement when they confront technological challenges. Thus, it is crucial to maintain a balanced perspective. While it's true that technology may assist instructors and students save time and energy by enabling them to conduct lessons and do assignments from the comfort of their homes, other factors might interrupt and impact a student's education. (Al-Samiri, 2021).

For their part, Tanjung and Utomo (2020) looked into how EFL students in Indonesia felt about using a fully online learning format to teach English. They found that students' perspectives of online education shifted in both positive and negative ways during the study. On the practical side, students develop research and critical thinking skills while becoming more comfortable with online tools and educational applications. As a result, the authors advocated for making certain technical adjustments to the platforms to get students more involved in their education.

Similarly, Diana and Catone (2016) made the case that adding online courses to traditional classroom instruction enhanced motivation for knowledge creation and reflexivity. This approach is becoming more prevalent in online education since it provides students with access to new environments and resources that foster the development of their knowledge, curiosity, and intrinsic desire to learn.

Learners' Engagement in Learning Research Methods

Despite their significance, classes in research methods are widely mentioned by undergraduate students as among the ones they dislike because they cause significant anxiety. (Slocum-Schaffer & Bohrer, 2019). Learning difficulties in research methods classes may occasionally have a negative influence on students' attitudes and interests in conducting research. In addition, Benson and Blackman (2003) mention that classes often concentrate on the teaching of theory instead of the application of research. They are frequently presented in the form of a receptive, lecture-based setting.

The results of recent studies reveal that passive, lecture-based techniques of teaching research methodologies have met with poor success and might result in a decline in student engagement and interest (Ball & Pelco, 2006). According to the available evidence, the most effective way for students to acquire research methodologies is to actively engage with the material (Nixon & Williams 2014). In this sense, since eLearning is widely acknowledged to be integrally connected to fundamental pedagogical theories and philosophies, it is understood that whatever eLearning's possible definition, it should explicitly include aspects of pedagogy. Tavangarian, Leypold, Nölting, Röser, and Voigt (2004), for example, pedagogically linked an eLearning model to a socio-constructivist approach to teaching.

Constructivist Approach to Teach Research Methods Online

With the development of the internet, the concept of eLearning was broadened, and it is now possible to describe it as the process of learning and developing skills using various online tools. However, eLearning focuses restrictedly on knowledge and skills acquisition rather than on the educational process, which cannot be achieved if not systematically accomplished through pedagogical purposes. Hughes (2008, p. 438) explained that: "Technology, without the pedagogy, can be a fetishized and empty learning and teaching experience – stylized but without substance or simply electronic information push."(as qtd in Rock, Coventry, Morgan, & Loi, 2016)

To fulfill the requirements of EFL curricula, institutions must incorporate new teaching approaches and tools to train students in research methodologies. Following the 21st educational stream, using digital resources supplemented with innovative educational approaches strengthens students' active participation in the learning experience. Al-Khatib (2009) and Kisling (2012) emphasized that this native digital generation is more likely to be interested in and receptive to technology resources in the teaching/learning environment.

Therefore, the cognitive theory, which was primarily based on a passive didactic learning method, was replaced by the constructivist approach that emphasizes active learning, reflection, independent thinking, and the sharing of knowledge through collaboration (Ertmer & Newby, 1993). More specifically, the constructivist learning theory holds that learners construct their knowledge of the world through shared experiences and reflective thought. Students need to learn how to do research and understand how to use information.

Consequently, the socio-constructivist pedagogical approach tends to be appropriate for the efficient instruction of research techniques via an eLearning platform. This approach encourages learners to be constructors of knowledge through their personal experiences and interactions with their peers and teachers. In this learning environment, teachers and learners together co-create knowledge and develop skills (Farkas, 2012).

This approach typically fits the *Research Technique* module via an e-learning platform where students connect to read and download the course content and the assigned activities. The instructor shows the lesson's goals and purpose before publishing the course material. Following the submission of the material, a second email is sent to students, inviting them to get access to the platform and to read and reflect on the course content. The instructor logs in to the platform regularly to monitor student presence/participation.

Since not everyone can get online simultaneously, the lecturer usually leads the discussion and gives out group projects through the Gmail app. The course's learning objectives are designed to help students improve their research abilities through (1) working effectively on empirical fields, (2) evaluating the information, (3) identifying suitable research methods and techniques for the project, (4) being disciplined and ethical researchers, and (5) developing a formal research proposal.

Method

The current research project is a case study. The researcher employs a mixed method approach since "mixing two methods might be superior to a single method as it is likely to provide rich insights into the research phenomena" (Dawadi, Shrestha, & Giri, 2021, p. 27).

Participants

A total of 86 third-year EFL students have been selected randomly in this study from the institute of foreign languages at Ahmed Salhi University Center of Naama, Algeria, during the

2021-2022 academic year. They were 26 males and 60 females. In addition, three instructors from the same context were interviewed.

Research Instrumentation

Malina, Nørreklit, and Selto, (2011) asserted that "quality criteria for quantitative research are well known and widely agreed, that is not necessarily the case for qualitative research." (p. 67) In this sense, the researcher designed a Likert-scale questionnaire to scrutinize the overall perspectives of EFL students regarding teaching *Research Techniques* online. The Likert scale included five gradual representations, from strong disagreement to strong agreement boxes, in addition to a neutral column. The questionnaire is divided into five sections.

To elicit teachers' opinions regarding the potential of eLearning in teaching *Research Techniques*, the researcher used a qualitative approach. Since semi-structured interviews are the finest qualitative research methods for acquiring a thorough description, they were used to collect information for this study (Bryman, 2012).

Research Procedure

Before collecting all data, the researcher informed the students about what was in the questionnaire and that the provided data would be disclosed anonymously and would have no effect on the actual course grades and that their participation is entirely voluntary. The questionnaire was divided into four sections, one of which asked students about their gender and age. The remaining sections demanded their thoughts on an eLearning platform's function in improving research proficiency and competencies. To ensure the questionnaire validity, it was piloted randomly with five students from the target population.

Additionally, after analysing the interview questions and defining their goals, the interview was available to teachers who used to teach *Research Techniques* via an eLearning platform. The researcher contacted EFL teachers via telephone to be interviewed. The researcher asks the same set of questions to all interviewees to standardize the data gathered (Bryman, 2012). The questions were open-ended.

The researcher informed the participants about the purpose of the study. They were respectfully invited to offer factual data to back up the validity and credibility of the study's findings. Four open-ended questions were asked to get data about the main research problems. The interviews lasted about 10 minutes. In the end, the researcher expressed gratitude to the participants and emphasized the guarantee of protecting their anonymity, and that their data remain confidential.

The interpretation of the questionnaire was derived from statistical analysis, while the analysis of the interview was accomplished through thematic analysis (Braun & Clarke, 2017). Analysing the provided data carefully allowed the researcher to retrieve ideas and perspectives relevant to the study's goals for the eventual discussion.

Results

The input accumulated from the questionnaire was used to generate the analysis outcomes presented in the following five sections. As opposed to the first section, section two, three and four concern the gathered data obtained from the Likert-scale. The researcher manages to combine *strongly disagree* and *disagree* to denote *disagreement* while *agree* and *strongly agree* to signify

agreement. The "neutral" box has not been altered in any way. Furthermore, a table detailing the number and percentage of respondents for each statement is provided for each section.

Questionnaire
Section One: Demographic Information
The first table provides information about the gender distribution of the sample.
Table 1: *Percentage of participants' gender*

Gender	Number	Percentage
Females	(60)	69.76%
Males	(26)	30.23%

While male students made up only 30.23 % of the sample, women participated at a rate of 69.76 %. Since the department reports that more females than males are enrolled in the third-year LMD English section, this finding has come as no surprise.

The following table shows the gathered data about the participant's age.
Table 2: *The participants' age*

Age	Number	Percentage
Between 21 and 28 years	70	81.4%
Between 29 and 40	12	13.9%
More than 41 years	4	4.6%

The age of the participants was the second question the researcher asked in this section. The results reveal that 77.9% of participants are between the ages of 21 and 28, which represents the majority of the population. Compared to 13.9% of respondents aged between 29 and 40, just 8.1% of survey participants were over 40.

Section Two: The Impact of Online Research Technique Courses on Developing the Learners' Personal Skills.

In the following sections, the researcher wants to determine if online courses in *Research Techniques* contributed to the students' personal development.

Table 3: *Personal skills developed along "Research Techniques" courses*

Statements	Disagree	Agree	Neutral
Promote autonomy	(2) 2.33%	(75) 87.20%	(9) 10.46%
Develop organization/time management	(5) 5.82%	(66) 76.74%	(15) 17.44%
Increase adaptability	(3) 3.49%	(70) 81.39%	(13) 15.11%
Act with integrity	(0) 0%	(75) 87.20%	(11) 12.79%

Table three displays respondents' answers about whether online research lessons are beneficial in personal development. The items *promoting autonomy* and *acting with integrity* have equally scored the highest percentage of the population (87.2%) for each. Meanwhile, 10.46% of respondents were neutral toward the former item, and 12.79% of them toward the latter one.

The statement of *increasing motivation and self-confidence* followed with a rate of 81.39% and 15.11% of neutral voices. *Developing organization and time management* received the lowest

score, with 76.74% agreeing and 17.44% expressing neither agreement nor disagreement. The data indicate that learning research methods via eLearning is fruitful and helps students developing their personal skills.

Section 3: The Effects of Online Research Technique Courses on Students' Ability to Study
        In this section, the researcher wants to uncover the impact of online lectures on improving EFL learners' study skills.

Table 4: *Study skills developed during "Research Techniques" courses*

Statements	Disagree	Agree	Neutral
Planning	(2) 2.33%	(76) 88.37%	(8) 9.30%
Critical thinking	(4) 4.56%	(74) 86.03%	(8) 9.30%
Critical reading	(6) 6.97%	(61) 70.93%	(19) 22.09%
problem-solving skills	(8) 9.30%	(66) 76.74%	(12)13.95%

Table Four shows the students' responses when asked if taking *Research Techniques* lessons through an online learning platform had improved their study skills regarding planning, critical thinking, critical reading, and problem-solving. The results show that 88.37% of the population ticked a box indicating their agreement with the development of planning skills, while 9.3% were silent.

        The rate concerning critical thinking skills was 86.03% in agreement, with neutral responses similar to the first item (9.3%). The *critical thinking* item scored 70.93% agreement and 22.09% neutral. The last item for problem-solving skills received 76.74% positive ratings and 13.95% unbiased ratings. As a consequence, utilizing the eLearning platform to teach research methods has been efficient in improving the learners' study skills.

Section 4: Effects of Online Research Technique Courses on Enhancing Students' Research Abilities (see appendix A, *Section Four Data of the Questionnaire*)
        This section includes multiple items to scrutinize the e-learning platform's contribution to improving research abilities and competencies when used as a tool for teaching the *Research Techniques* module to Algerian EFL learners.

        According to the obtained data in Table five, the majority of respondents, 79 students (91.86%), claimed that the eLearning platform has been useful in improving their research skills in terms of defining the research question and hypothesis, carrying out the related literature review, and prioritizing methodology. The unvoiced remarks were evaluated at 7.64% on average. Just 0.38% (on average) of people disagreed. When it comes to the item of *know about research theories/philosophies*, *analyse critically the quality of research project*, and *develop research proposal* 93.02% of the respondents selected the boxes of agreement except for 6.1% of indifferent views. In the same manner, 81 participants (94.18%) have admitted the advantage of learning online by acquiring some computer skills, identifying a research topic, and even conducting the research design and sampling. The neutral voices scored an average of 4.26%, while the disaccord average was only 1.55%.

        Additionally, similarity in the obtained results shows that 78 students (90.69%), along with an average of 3 disagreements and 6 silent voices, were related to positive views about the clarification of the research problem and objectives, the independent work to develop a research, learning how to use web resources, and sketching the steps of research process. Moreover, the same number of students (74) mentioned their accord for two items: *get prepared for research*

work and *acquire adequate linguistic register*. The value was 86.03% of conformity on the statements, as opposed to 13.95% of unbiased voices.

On the same line, the item investigating the agreement about working on researching fields effectively received 88.37% (76 students) of the total responses, while 2.33% did not express any opinion. Students revealed their positive views when asked whether their *empirical skills* and *analytical abilities* have increased; the results were consecutively 97.67% (only 2.33% were neutral) and 96.51% (3.49% said nothing). The highest score for the *development of teacher-learner communication*, is 98.83% of confirmation. Thus, in this section, the participants confirmed the eLearning platform's positive contribution to their research skills.

Interview

The interview approach was used to determine the instructors' opinions and tribulations while teaching online courses. The following concerns were raised throughout the interviews:

- What do you think about the e-learning platform?
- In what way is face-to-face instruction in *Research Techniques* different from online instruction?
- What are the benefits of eLearning in teaching the *Research Technique* module?
- What are the drawbacks of utilizing the eLearning platform to teach research methods?

The following statements summarize the teachers' responses.

- Online courses have been beneficial for our students.
- Teachers adapted the physical classroom content into online courses
- The benefits of online teaching lie in the fact that students are no more distracted and have become less bored while learning online.
- Some students attend only the first two classes, and the last two before the final test..
- Some students still have digital difficulties because they do not have a computer.
- For better teaching, we need to learn more and more about using technology.

The results showed that teachers of English in the department of foreign languages have a favorable outlook on the use of online resources. They are aware of the many benefits that come with using an eLearning platform for teaching their courses. The respondents have similar positive attitudes towards teaching in face-to-face classrooms and online ones. They reveal that students, who used to feel disengaged and lack interest in learning research methods in a physical classroom, are less bored when learning online, perhaps because they are learning in their preferred context.

Despite the specific positives, some drawbacks need to be considered. Both sets of features should be carefully weighed. All teachers comment that students show interest during the first courses only. There are peaks of presence in eLearning courses, and students' participation dropped continuously until the few days before the exams. Regardless of the students' basic computer skills, a lack of digital literacy remains a barrier to effective learning. Other factors challenge their successful engagement, such as the low access rate to the websites because of the poor quality of the internet. In addition, some students do not possess a computer. They rely on resources in cyber-cafes.

In short, all instructors believe that online instruction has helped learners' language and research abilities. However, they all acknowledged that they lacked technical knowledge, and it has become challenging to pick up new digital skills.

Discussion

In light of the crucial role that online education plays for teaching/learning research approaches in the Algerian university context, the current investigation was carried out to question: (1) To what extent has e-learning platform been effective in the process of teaching/learning research techniques to L3/LMD students of English in Naama University Center? (2) Has the eLearning platform improved the EFL learners' skills? (3) How does it affect the development of EFL learners' research abilities? And (4) What are the EFL teachers' impressions and the challenges they face regarding the use eLearning platform to teach research techniques?

As far as the effectiveness of online learning on learners' acquisition of research skills is concerned, the results of the fourth section demonstrated that learners agree on its role in improving their multiple abilities to conduct research. This fits the research findings of Tanjung and Utomo (2020), who looked into how EFL students in Indonesia perceive online courses and discovered that both positive and negative changes occurred in students' views of online learning. The good news is that the e-learning has been effective since students learned how to conduct research and use their critical thinking. It also corresponds to Farkas's (2012) and Ertmer and Newby's (1993) accords about the benefits of online lessons in knowledge construction found in learners' responses to Section four. This answers the first research question about the effectiveness of online platforms in enhancing the understanding of *Research Techniques* courses.

According to the findings, online research techniques lessons can accomplish a lot because digital materials stimulate their motivation and autonomy while also challenging them to improve their personal abilities regarding *organization*, *time management*, and *honesty*, as shown in table three. Furthermore, most students believed that the use of eLearning platform in teaching research methodologies could improve their study abilities, as Table four indicates. These results are in line with the revelation of Levy and Stockwell (2006), which they emphasize that online learning promotes learners' independence and adaptability. Furthermore, the analysis of the current study shows that eLearning courses stimulate learners' personal motivation and enhance their critical thinking and communicative skills. These results coincide with the perceptions of Rahim and Chandran (2021) and Diana and Catone (2016) that those are among the essential skills in today's classroom. These results answer the second research question.

The view that teachers require digital literacy to cope with the new learner-centered teaching approaches delivered to the native digital generation matches the opinions of Lytras et al. (2020), which indicate that to effectively transmit knowledge, the role of the educator shifts from that of a knowledge distributor to that of a co-partner. This opinion also fits Naz and Murad's (2017) notion that supporting innovative teaching methods is significant in education nowadays.

According to the research findings, online material has been fruitful in helping students acquire the needed research skills and facilitating their engagement in prioritizing their research projects. These ideas correspond to those of Nixon and Williams (2014), who see that the most effective way for students to acquire research methodologies is to engage with the online learning material actively. This answers the third research question of the study.

The fourth research question is answered in the findings of the interview. The interview results show that the teachers' opinion that students were less engaged in face-to-face courses than in online lessons aligns with the recent studies of Slocum-Schaffer and Bohrer (2019) and Ball and Pelco (2006), which demonstrate that lecturing and passive teaching strategies have had slight effectiveness and may cause a decline in student interest and involvement in learning research methodologies. The teachers' perceptions regarding the learners' interest in learning research

techniques via online platforms seem compatible with Al-Khatib's (2009) argument that native digital generations are more likely to be interested in and receptive to using technology resources in the teaching/learning environment.

The three instructors acknowledged their lack of technological experience. They noted the necessity to quickly pick up new digital skills, which are considered a factor of difficulty. The outcome of the qualitative data aligns with Al-Samiri's (2021) argument that even though technology can help teachers and students save time and energy, other factors interfere with and affect the learning process.

One limitation of the current study was that the sample was limited to only EFL students from the third-year. Therefore, the generalizability of the results is constrained by the lack of information on how Algerian students at different levels are impacted by online lessons in research methods. It would be more fruitful to conduct research on a larger group of students over a more extended period that involves repeated observations and an examination of how their attitudes evolve and their skills improve.

Accordingly, for future research, the researcher suggests the use of a pre- and post-test method in ascertaining students' continuous attitudes and perceptions about the research subject until its completion. In addition, examining a variety of courses/modules might provide additional information about what works well in an online classroom.

The researcher recommends professional development opportunities for teachers to improve their proficiency in using technology devices to access online materials and promote student cooperation and engagement. Moreover, *Research Techniques* course developers and instructors should be familiar with quality online course planning and design practices to provide students with the best opportunity for success in conducting research projects. Developing appropriate constructive research pedagogies for knowledge creation is imperative with the effective use of eLearning technologies.

Conclusion

This study builds on the contemporary debate on the efficiency and effectiveness of using online learning in teaching EFL students. It aims to investigate how effective online learning is at teaching research techniques in EFL classrooms. The emerging findings demonstrate that the educational process of *Research Techniques* is effective in online mode for EFL learners despite its drawbacks such as network problems and device matters. Learners can gain motivation, communication skills, adaptability, critical thinking, problem-solving abilities, and autonomy. Besides, eLearning format develops not only their language skills but also their research abilities and personal development.

Therefore, this research suggests that learning research methods and practices could be more effective with the integration of technology. Students can significantly benefit from the use of e-learning as a factual teaching tool in learning research methods. In this context, the education system in Algeria should consider eLearning as a method of the educational process rather than a plan under experience to better accommodate the expectations of the current and next generations to be technologically savvy.

About the author
Dr Nadjia BOUSSEBHA is an Associate Professor at Ahmed Salhi University Centre of Naama, Algeria. She worked as a teacher trainer and has almost three decades of experience in

teaching English in Algerian schools and universities. Her professional interests include Research Methodology, Literature, Modern Education and Gender Studies.
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Appendices
Appendix A
Section Four Data of the Questionnaire

This appendix represents participants' responses regarding the effect of online education on the improvement of Algerian EFL learners' research skills.

Table 5: *Research skills developed during online Research Techniques lessons*

Statements	Disagree	Agree	Neutral
Get Prepared for Research Work	(2) 2.33%	(74) 86.03%	(10) 11.62%
Learn how to use web resources	(3) 3.49%	(78) 90.69%	(5) 5.82%
Acquire some computer skills	(2) 2.33%	(81) 94.18%	(3) 3.49%
work on researching the field effectively	(2) 2.33%	(76) 88.37%	(8) 9.30%
Sketch the steps of the Research Process	(0) 0%	(78) 90.69%	(8) 9.30%
Acquire the adequate linguistic register	(0) 0%	(74) 86.03%	(12) 13.95%
Identify the topic	(2) 2.33%	(81) 94.18%	(3) 3.49%
know about research theories/philosophies	(1) 1.16%	(80) 93.02%	(5) 5.82%
Develop empirical skills	(0) 0%	(84) 97.67%	(2) 2.33%
Enhance analytical skills	(0) 0%	(83) 96.51%	(3) 3.49%
Develop research project independently	(4) 4.56%	(78) 90.69%	(4) 4.56%
Analyze critically the research project quality	(0) 0%	(80) 93.02%	(6) 6.97%
Facilitate student-lecturer communication	(0) 0%	(85) 98.83%	(1) 1.16%
Recognize qualitative and quantitative methods	(2) 2.33%	(82) 95.34%	(2) 2.33%
Clarify the research problem and objectives	(2) 2.33%	(78) 90.69%	(6) 6.67%
Define the research questions and hypothesis	(1) 1.16%	(79) 91.86%	(6) 6.67%
Carry out the related literature review	(0) 0%	(79) 91.86%	(7) 8.13%
Prioritize methodology and methods	(0) 0%	(79) 91.86%	(7) 8.13%
Conduct research design and sampling	(0) 0%	(81) 94.18%	(5) 5.82%
Develop a research proposal	(0) 0%	(80) 93.02%	(6) 6.67%