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# The Effect of Online Language Learning on ESP Learners' Autonomy: Exploring Students' Perceptions of Using Adobe Connect Breakout Rooms

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**Abstract**

Online instruction utilizes emerging technologies to help language learners improve learner-related factors like autonomy, which can affect the language acquisition process. As online education programs increase, autonomous learning becomes more necessary for academic success. This explanatory sequential mixed-method study aimed at examining the effect of online (synchronous) language learning and gender on ESP learners' autonomy and exploring their perceptions of the utility of this kind of instruction in improving their autonomy. Through convenience sampling, 60 ESP learners were selected from Kashan University of Medical Sciences after checking homogeneity regarding English proficiency level. Then, they were randomly assigned to the experimental (Adobe Connect breakout rooms) and control (in-person) groups. During 13 treatment sessions, the researcher used Adobe Connect breakout rooms to provide learners with a collaborative language learning task. Quantitative and qualitative data were collected using Zhang and Li's Learner Autonomy Questionnaire and a semi-structured interview, and then they were analyzed using two-way ANCOVA and thematic analysis, respectively. The quantitative findings indicated a positive effect of virtual learning on learners' autonomy, and female learners demonstrated greater gains in autonomy within the virtual learning context. Additionally, participants praised virtual instruction for its role in fostering learner autonomy through independent learning, better decision-making, and enhanced creativity. The results may provide ESP teacher educators and curriculum developers with guiding principles regarding the utility of virtual language instruction in ESP contexts.

*Keywords:* Online synchronous learning, ESP, Learner autonomy, Collaborative language learning

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## 1. Introduction

Digital technologies are an increasingly prominent feature of contemporary education provision and practice around the world and are central to the popular imagination of the future of education (Facer & Selwyn, 2021). Virtual language instruction is extensively utilized in diverse settings within the field of Second Language Acquisition (SLA), a surge accelerated by its global promotion during the COVID-19 pandemic (Liguori & Winkler, 2020).

Doumanis et al. (2019) pointed out that virtual language instruction is the kind of instruction that takes advantage of technological advancements to provide learners with education and facilitate and expedite interaction between the instructors and the learners. Moreover, Perveen (2016) and Lo and Lin (2019) stated that online learning environments can be divided into synchronous, asynchronous and hybrid learning environments. They suggested that synchronous online language learning was beneficial for second language (L2) learners and involved real-time interactions and live communication between students and instructors, fostering immediate feedback, collaboration, and engagement. They claimed that successful virtual instruction, especially synchronous instruction, largely depends on using proper applications, such as Learning Management Systems (LMS). In recent years, synchronous platforms such as Zoom and Adobe Connect have emerged as popular choices for online language learning due to their integration of multimedia tools and real-time collaboration features.

Moreover, Schoonenboom (2014) noted that synchronous LMSs, including Adobe Connect, became particularly prominent during the Coronavirus pandemic. As he pointed out, the learners' language learning might be associated with individual factors such as their motivation and autonomy. These factors comprise the language learners' individual attributes, which differentiate them from their peers and sway the rate and ultimate state of their language acquisition in language classrooms (Adnan et al., 2020; Dörnyei, 2005; Ellis, 2008).

Most studies addressing these factors, especially learner autonomy, have been confined to traditional in-person classrooms (e.g., Parvaneh et al., 2020; Rezabeigi et al., 2021), neglecting the examination of these factors in the context of virtual instruction (especially online synchronous instruction using breakout rooms) across diverse academic settings.

Furthermore, the related studies have overlooked the potential influence of gender in virtual language instruction. Considering these

issues, the present study examined the effect of online (synchronous) language instruction and ESP learners' gender on their autonomy. Moreover, it examined the learners' perceptions of the utility of this kind of instruction for promoting their autonomy. Thus, the present study strived to answer the following questions:

1. Do synchronous online language learning and gender significantly affect ESP learners' autonomy?
2. What are the perceptions and experiences of ESP learners regarding the effectiveness of online synchronous language learning in enhancing their autonomy?

## 2. Review of Literature

SLA researchers have developed different types of virtual language instruction ranging from in-person courses to online synchronous courses (Astuti & Anjarwati, 2021). According to them, the relevant types of this kind of instruction can be arranged on a continuum from the traditional in-person courses, which employ certain features of virtual language instruction, to the courses, which completely depend on the uses of the LMS. This learning management system enables its users to: a) chat with other users with the help of public-chatting and private-chatting features; b) take advantage of the microphone and camera features of the system in order to engage in audio-visual interaction with the users of the system; c) share different kinds of files with the other attendees; d) share the screen of the computer or smartphone with the users, and e) carry out different educational tasks in the breakout rooms which can be monitored by the host of the session.

Audi (1991) defined autonomy as an individual's capability to make informed decisions without being influenced by diverse contextual factors. Piaget (1955) stated that autonomy stems from the individuals' free choices and acts as a supervising agent in their social interactions. He defined autonomy as the ability to determine one's behavioral patterns by following certain rules instead of others. Moreover, he argued that autonomy reflects a higher level of cognitive development. That is, individuals with higher levels of autonomy can modify their self-chosen rules based on contextual requirements. As Brown (2007) pointed out, learner autonomy is likely to affect the various aspects of the learners' language acquisition in different language courses, including ESP courses.

In the field of SLA, researchers have been dedicated to developing ESP courses that cater to learners' specific language learning needsin

various fields or occupations (Dudley-Evans & St. John, 1998; Hutchinson & Waters, 1987). Notably, Hyland (2006) highlighted the significant role of ESP courses for medical students, who must extensively use English in their education and professional life, making these courses of paramount importance.

The study focused on exploring the potential of online (synchronous) language learning, specifically the use of breakout rooms, to improve learners' autonomy in ESP courses. The findings of this study could pave the way for a more autonomous and empowered generation of language learners.

## 3. Method

### *3.1. Research Design*

The present study used an explanatory sequential mixed-method design to examine the effects of online synchronous instruction using breakout rooms on medical students' autonomy. In the initial (quantitative) phase, the researcher collected data using the autonomy questionnaire pre-test and post-test. The second (qualitative) phase utilized semi-structured interviews to provide depth and context to the results obtained in the first phase.

### *3.2. Sampling and Participants*

Aligned with the study's objectives, in the quantitative phase of the study, the researcher used convenience sampling to select 60 male and female intermediate-level ESP learners (34 females and 26 males; age range, 19-28) in two equal intact classes of Kashan University of Medical Sciences, Kashan, Iran, as the participants of the quantitative phase based on their results on Oxford Placement Test (Allan, 2004) out of an initial pool of 73 ESP learners in September 2022.

The intact classes were randomly assigned to the experimental and control groups. The study's inclusion criteria comprised junior/intermediate students and enrollment in the specialized English course for the students of medicine. On the other hand, the exclusion criteria involved attending language lessons in language institutes. In the qualitative phase, the virtual group participants were randomly selected and interviewed until data saturation was achieved. Prior to the study, the researcher obtained written consent from all participants.

### *3.3. Materials and Instruments*

The researcher used the Oxford Placement Test (Allan, 2004) to select intermediate-level learners. Allan (2004) averred that Cronbach's alpha reliability (.87) and concurrent validity (.89) indices of the test were acceptable, and it constituted an efficient instrument for examining language proficiency. Notwithstanding, the researcher used Cronbach's alpha measure of internal consistency to specify the reliability of this test. The results of the performed analysis unveiled that the reliability index of the test (.82) was acceptable, and it could be used in the EFL context of Iran. Moreover, students used collaborative vocabulary learning tasks using medical vocabulary from the course books "English for the Students of Medicine (I) & (II)" (Deedari & Zia Hossainin, 2017; Tahririan & Mehrabi, 2018).

In this study, the researcher used Zhang and Li's (2004) Learner Autonomy Questionnaire as both a pretest and a posttest to assess the participants' autonomy before and after the treatment sessions. This questionnaire comprises 21 items in two sections. The first part encompasses 11 items, rated on a 5-point Likert scale ranging from Never to Always. The second section comprises ten forced-choice format items that examine respondents' perceptions toward principles of learner autonomy. This inventory was developed based on the work of Wenden (1998) and O'Malley and Chamot (1990) on learning strategies. Zhang and Li (2004) reported satisfactory validity (.89) and reliability (.85) indices for the questionnaire. According to previous studies, the questionnaire has high content validity and reliability (Dafei, 2007; Farivar & Rahimi, 2015; Halstead & Zhu, 2009; Nosratinia & Hossaini, 2018; Sadaghian & Marandi, 2016). Moreover, this value was 0.80 for ESP students studying psychology at Semnan University in Iran (Peyvandi et al., 2021). However, the researcher employed Cronbach's alpha measure of internal consistency, determining a reliability index of .82, affirming its suitability for use in the current study.

Furthermore, in line with the study's objectives, the researcher drew upon pertinent literature and questionnaires addressing learner autonomy (Farivar & Rahimi, 2015; Halstead & Zhu, 2009; Nosratinia & Hossaini, 2017; Sadaghian & Marandi, 2016) to formulate the semi-structured interview checklist (questions), which constituted the main instrument of the qualitative phase of the study. This interview examined the learners' perceptions of the utility of online instruction (through Adobe breakout rooms) for improving their autonomy and self-directed learning.

### *3.4. Procedure and Data Analysis*

The researcher administered the pretest of autonomy to the virtual and control groups before treatment sessions. The virtual group received a collaborative vocabulary task via Adobe Connect breakout rooms over 13 sessions of 90 minutes each, while the control group received these tasks through in-person instructions. The researcher utilized Nunan's (1989), Skehan's (1996), and Willis's (1996) perspectives on collaborative tasks, emphasizing the four main characteristics of using the target language, collaboration, focus on meaning, and producing an outcome. Willis's (1996) stages of collaborative tasks (pre-task, during-task, and post-task) were also considered in task development. At the pre-task stage (the main room of Adobe Connect), learners in both the virtual instruction and control groups were asked to activate their background knowledge by answering questions about the session's topic. During the task stage (the breakout room of Adobe Connect), the researcher randomly assigned five learners to each of the six groups in each group type to facilitate collaboration. A representative was chosen for each group to enable the researcher to manage class time effectively. The researcher instructed groups to use the target language to perform the collaborative vocabulary learning task, interact and share knowledge to understand and define specific technical words (10 highlighted words, each session) in a text and write a two- to three-paragraph (i.e., a minimum of 150 words) summary of their discussions using all of the highlighted words. Regular monitoring, feedback, and answering questions were provided to support task performance. The researcher asked the participants to organize their ideas and their peers' ideas in the form of a list and write them on the "Note" section of the Adobe Connect platform in order to use them in paragraph writing. The researcher encouraged collaborative writing tasks among learners by assigning specific roles based on individual strengths, monitoring group performance, and providing feedback on English language usage. Finally, at the post-task stage (in the main room of Adobe Connect), the researcher asked the representative of each group to present its finished task output (i.e., outcome), and answer the questions regarding the text's new words and their meanings and synonyms. The summaries involved information on the causes, symptoms, risk factors, preventive measures and medical advice, and diagnosis and treatment methods of a specific disease, which were obtained by group members' role-playing or discussion/debate while performing the task in the task stage. The

researcher provided each group with feedback on the content and form of its summaries.

Furthermore, the instructor informed the learners about the definition, pronunciation, synonyms, and one example sentence of the different vocabulary items of the text, especially the highlighted words (using the Textbox feature of Adobe Connect Whiteboard and flashcards).

The control group followed similar procedures in in-person classes without using the Adobe Connect system, relying on PowerPoint files and paper tasks.

In the quantitative phase, the researcher used descriptive statistics and inferential statistics, including the two-way ANCOVA test, together with the normality tests (e.g., Kolmogorov-Smirnov and the Shapiro-Wilk tests) and homogeneity of the variance test (e.g., Levene's test) to perform the data analysis. Afterward, qualitative data were collected through semi-structured interviews and analyzed using thematic analysis.

Thematic analysis was employed to extract the underlying themes from the participants' responses to the interview questions. Researchers use thematic analysis to familiarize themselves with the data, develop codes, search for themes, review themes, define and name themes, and write reports (Braun & Clarke, 2022). The interview included several main questions that were expanded according to the responses received. The interviews were conducted virtually through Adobe Connect, which may help interviewees feel more at ease during the interview questions and voice recordings. Participants were asked for their approval to record the interviews and accept that anything they said would be used for research goals before the session began. Each interview lasted for at least 20 minutes.

Then, students' responses were recorded for transcription and further thematic analysis. The instructor let the instances of the learners' responses to the items determine the themes in the data. To this end, she first took notes of each of the interviewed participants' answers to the interview questions on a certain form, which involved information on the relevant interviewee. These notes provided the researcher with a background of the relevant interviewee's ideas and facilitated the process of the analysis of her transcribed interview data. Moreover, they enabled the researcher to pay more careful attention to certain aspects of the data when analyzing the other participants' interview data. Then, the transcribed interview data of each participant were analyzed after his/her

relevant interview session using MAXQDA 2024. There were three analysis levels: initial coding, focused coding (category), and axial coding (theme development). During the interviews, the researcher gained a thorough understanding of the interview questions, both in terms of their underlying assumptions and what she wanted to know about them. While reading through the data, the researcher looked for words, sentences, and paragraphs that contained a message or idea relevant to the interview questions (initial coding). The researcher dealt with codes by locating these points and identifying them using MAXQDA. The codes were words or statements that were relevant to the interview questions. The researcher determined the codes in the data by highlighting the recurrent keywords, phrases, and sentences (also referred to as in-vivo codes taken directly from the participants' wordings) and by specifying similar ideas, points of view, attitudes, and perceptions. When the researcher was assessing the data, she noticed not only separate items and ideas associated with the interview questions but also recognized interconnections and commonalities among the specific codes (known as focused coding). Moreover, the researcher integrated similar codes to determine broader categories. This step helps researchers explore their data's underlying structure and develop more nuanced interpretations. Finally, themes emerged where codes and categories were grouped or matured based on characteristics or meanings. The themes extracted are higher-order concepts that provide a more abstract and comprehensive understanding of the data. By following these coding steps in MAXQDA, researchers can systematically analyze their data, uncover key insights, and develop rich and nuanced interpretations.

Concerning content validity, language, and content appropriateness, the researcher asked five ESP instructors (PhD holders in TEFL) to evaluate the items of this interview. The set of questions was presented to the experts as a checklist to assess the appropriateness and relevance of the questions for the study's context. The researcher made further modifications based on the experts' feedback, ensuring that the interview questions exhibited satisfactory content validity and were suitable for the present study. The questions were asked in Persian and then translated into English for better transparency of the questions and answers.

In this study, Lincoln and Guba's (1985) concept of trustworthiness (including credibility, transferability, dependability, and confirmability) was utilized to ensure the trustworthiness of the qualitative data. Credibility was established through in-depth engagement with

participants, facilitated by thorough interviews conducted after the quantitative phase. Furthermore, triangulation, drawing insights from interviews and existing quantitative data, added layers of credibility by validating and strengthening the study's conclusions. Peer debriefing sessions were also conducted, involving discussions with colleagues well-versed in qualitative research to critically review the research process, findings, and interpretations.

Moreover, transferability, or the ability to apply findings to other contexts or populations, was supported by thick description. Clear explanations of methodology and analytical techniques further bolstered the transferability of insights to related research contexts.

Furthermore, intercoder reliability checks were conducted by involving two researchers (PhD in TEFL) in the thematic coding and analysis process, ensuring consistency and validity in data analysis. Intercoder reliability for thematic analysis was assessed using Cohen's kappa coefficient, resulting in a high agreement level of $\kappa = 0.85$, indicating strong reliability in coding and interpreting qualitative data.

Finally, confirmability, emphasizing objectivity and neutrality in research processes and interpretations, was maintained through rigorous documentation and reflexivity. An audit trail transparently documents decision-making processes and interpretations, enabling external auditors to assess the objectivity of the study's findings. Reflexivity, through critical reflection, addressed potential biases and enhanced the objectivity and confirmability of the research outcomes.

## 4. Results

This section provided a comprehensive presentation of the research findings, encompassing a detailed analysis derived from both qualitative and quantitative methodologies.

### *4.1. Results of the Quantitative Data Analysis*

The results of the normality tests regarding the performances of the virtual group on the pretest and posttest of the study are shown in Table 1.

Table 1. *Tests of Normality for Pretest and Post-test of the Virtual Group*

| | Kolmogorov-Smirnov | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Language Learner Autonomy Pretest | .121 | 30 | .200 | .959 | 30 | .257 |
| Language Learner Autonomy Posttest | .154 | 30 | .078 | .931 | 30 | .052 |

As shown in Table 1, the p-values in the results of the Kolmogorov-Smirnov and Shapiro-Wilk tests (i.e., Sig) were higher than .05. Therefore, the data were normally distributed.

Moreover, Table 2 provides the results of the tests of normality regarding the performances of the control group on the pretest and posttest of the study.

Table 2. *Tests of Normality for Pretest and Posttest of the Control Group*

| | Kolmogorov-Smirnov | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Language Learner Autonomy Pretest | .147 | 30 | .098 | .945 | 30 | .123 |
| Language Learner Autonomy Posttest | .115 | 30 | .200 | .985 | 30 | .596 |

As shown in Table 2, the p-values in the results of the Kolmogorov-Smirnov and Shapiro-Wilk tests were higher than .05. Therefore, the data were normally distributed.

Considering the aim of the first research question, the researcher used two-way ANCOVA to analyze the obtained data. Table 3 provides descriptive statistics for the performances of the virtual and control groups in the autonomy posttests of the study.

Table 3. *Descriptive Statistics for Autonomy Posttests of the Two Groups*

| Gender | Group | Pretest | Posttest |
|---|---|---|---|
| Male | Virtual | 42.56±2.92 | 63.75±6.84 |
| | Control | 40.89±3.58 | 43.89±3.27 |
| Female | Virtual | 41.21±2.66 | 68.21±1.76 |
| | Control | 42.08±2.61 | 44.08±2.71 |
| Total | Virtual | 41.93±2.84 | 65.83±5.55 |
| | Control | 41.37±3.23 | 43.97±3.01 |

As shown in Table 3, the male and female learners in the virtual group had better performances on the posttest (M = 63.75, SD = 6.84; M = 68.21, SD = 1.76) compared to those of the control group (M = 43.89, SD = 3.27; M = 44.08, SD = 2.71). However, the researcher had to check the results of the ANCOVA test. Before analyzing the results of this test, it was essential to examine the homogeneity of variances. Table 4 shows the relevant results.

Table 4. *Levene's Test of the Two Groups on Learner Autonomy*

| F | df1 | df2 | Sig. |
|---|---|---|---|
| 1.883 | 3 | 56 | . 143 |

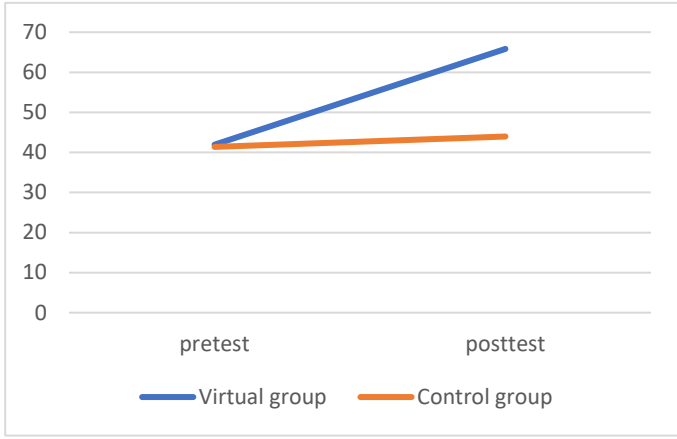
As shown in Table 4, the p-value in the results of Levene's test (i.e., .143) exceeded the cut-off point of .05. Table 5 provides the results of the ANCOVA test:

Table 5. *Two-way ANCOVA Test for Learner Autonomy of the Two Groups*

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|---|
| Corrected Model | 7365.386 | 4 | 1841.346 | 105.273 | <.001 | .884 |
| Intercept | 537.281 | 1 | 537.281 | 30.717 | <.001 | .358 |
| Autonomy Pretest | 44.037 | 1 | 44.037 | 2.518 | .118 | .044 |
| Gender | 81.087 | 1 | 81.087 | 4.636 | .036 | .078 |
| Group | 6985.630 | 1 | 6985.630 | 399.380 | <.001 | .879 |
| Gender * Group | 88.110 | 1 | 88.110 | 5.037 | .029 | .084 |
| Error | 962.014 | 55 | 17.491 | | | |
| Total | 189168.000 | 60 | | | | |
| Corrected Total | 8327.400 | 59 | | | | |

According to Table 5, the p-value of the effect of gender (.036) was less than .05. Moreover, the p-value of the effect of the type of instruction (<.001) and the p-value of the interaction effect between the gender and type of instruction (.029) was less than .05. Therefore, the learners' gender, the virtual instruction, and the interaction between the learners' gender and virtual instruction significantly affected the male and female ESP learners' autonomy.

Figure 1. *Performances of the Two Groups on Learner Autonomy*




As shown in Figure 1, the virtual group outperformed the control group regarding learners' autonomy.

### *4.2. Results of the Qualitative Data Analysis*

Considering the second research question of the present study, the researcher reported and described participants' perspectives and experiences by employing supporting extracts from the interviews.

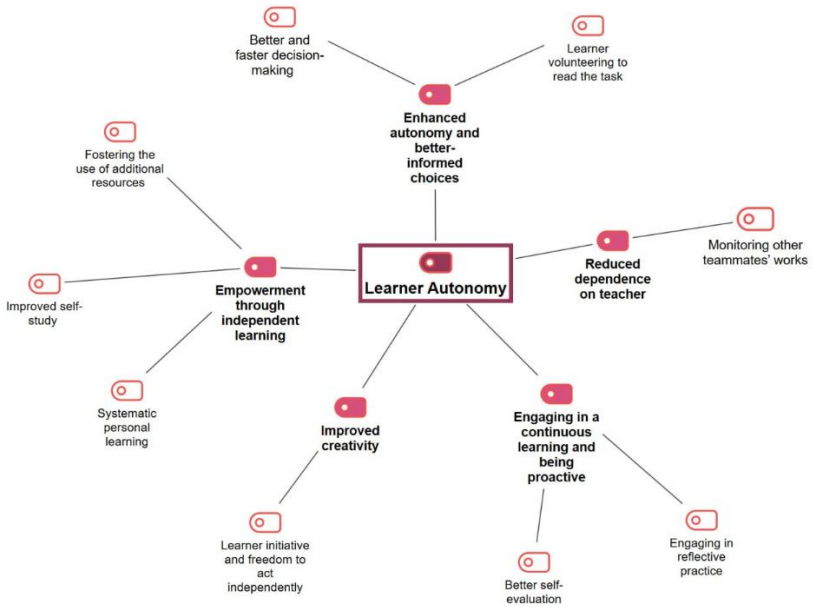
### *Perceptions of the Effect of Virtual Instruction on Learners' Autonomy*

Table 6. *Perceptions of the Effect of Virtual Instruction on Learners' Autonomy*

| Codes | Categories | Themes |
|---|---|---|
| Fostering the use of additional resources | Self-directed learning | Empowerment through independent learning |
| Improved self-study | | |
| Systematic personal learning | | |
| Volunteering to read the task | Self-determination and informed decisions | Enhanced autonomy and better-informed choices |
| Better and faster decision-making | | |
| Engaging in reflective practice | Learning through experiences and mistakes | Engaging in continuous learning and being proactive |
| Better self-evaluation | | |
| Learner initiative and freedom to act independently | Critical thinking ability | Improved creativity |
| Monitoring other teammates' works | Peer assessment | Reduced dependence on teacher |

Five themes emerged regarding learner autonomy from the voice of students experiencing virtual synchronous classrooms using breakout rooms: (a) Empowerment through independent learning; (b) Enhanced autonomy and better informed choices; (c) Engaging in the process of continuous learning and being proactive; (d) Improved creativity; (e) Reduced dependence on the teacher. Table 6 and Figure 2 show these themes and their relevant categories and codes.

Figure 2. *The Concept Map regarding the Perceptions of the Effect of Virtual Instruction on Learners' Autonomy as Depicted by MAXQDA*




### *(a) Empowerment through Independent Learning*

Virtual language learning encourages learners to engage in self-directed learning, learn at their own pace, focus on their interests, use additional resources, and improve their self-study skills. Self-directed learners pursue learning materials outside of a particular course, such as online tutorials, study groups, or online books, because they have determined that they need more than what is available in the course to achieve their own learning goals and objectives. Participant 9 noted that:

> *"The use of the Adobe Connect system made me more technology-wise. Working with these platforms enabled me to*

> *easily use the computer and various sites related to language learning. I learned new words easily since I had access to more synonyms and collocations using the sites introduced by the teacher (e.g., the OZDIC dictionary). Moreover, I use vocabulary books and flashcards to learn English vocabulary. These resources improved my ability to memorize new words better."*

This extract shows that the relevant system motivates learners to use technology to learn the language independently by using additional resources.

Moreover, participant 4 pointed out that:

> "*I regularly evaluated my learning progress based on the final results of tasks, teacher feedback, and online class quizzes. I want to learn more than my classmates because I want to speak English or write an article in my field."*

This excerpt highlights the fact that virtual instruction helps learners evaluate their progress regularly and be autonomous in choosing their materials and resources.

***(b) Enhanced Autonomy and Better Informed Choices***

A virtual language environment helps learners foster autonomy by creating engaging course designs and encouraging learner collaboration. A course design that is engaging and aligned with the learners' needs and expectations can suit different learning styles and preferences and provide opportunities for learners to enhance their autonomy and make better decisions. Participant 17 noted that:

> *"As the class sessions progressed, I was able to read the text by myself and perform the tasks better. By working with my peers, we could share our ideas and experiences and learn from each other. Most of the time, I edited the final version of the writing task and volunteered to read the task in the main room."*

This excerpt shows that virtual classrooms encourage learners to develop initiative, solve problems, express themselves, and be accountable during task performance.

In addition, participant 12 pointed out that:

> *"I actively engaged in group work and discussions, assisting my peers by correcting their mistakes. Additionally, I often took the lead in making final decisions on the words and sentences to be included in our task, presenting them in the Adobe's main room after the completion of the task."*

This narrative emphasizes that an online learning platform motivates students to be autonomous and make informed choices in the process of language learning.

***(c) Engaging in Continuous Learning and Being Proactive***

Implementing online learning platforms allows learners to learn at their own pace. Online courses not only provide information but also teach various skills, which allow students to learn in a more interactive way, integrating different tools to accommodate all learning styles, from video to written text to quizzes to discussion boards. Moreover, virtual language instruction helps learners proactively identify and prevent potential problems to expedite learning and save time. Participant 7 noted that:

> *"I made a conscious effort to select the right words and adhere to grammar rules while composing paragraphs, aiming to avoid the need for extensive revisions due to grammatical errors or inappropriate vocabulary choices. This approach helped us save time and complete tasks promptly. Additionally, I actively participated in group work and discussions supporting my peers by identifying and rectifying their errors."*

This narrative accentuates the fact that virtual instruction helps learners be proactive and make informed choices in the process of language learning.

In addition, participant 18 pointed out that:

> *"The link and materials that were provided by our teacher in the system made me aware of the fact that learning the vocabulary items was a multi-layered process. That is, I needed to know the collocations of the relevant words in order to be able to use them in an authentic way. This issue prompted me to look for the uses of the words in different contexts and encouraged me to use the words in various sentences to learn them in a satisfactory way. Furthermore, these materials made me aware that the pronunciation of the vocabulary items was important to their acquisition and prompted me to check the pronunciation of all of the new words that I encountered in our lessons."*

This excerpt indicates that learners' access to the supplementary materials of their classes prompted them to ameliorate their task performance by searching for useful words independently.

Furthermore, participant 2 pointed out that:

> "I tried to write my sentences using the highlighted words in the text, and then I checked what I had written for spelling and

> grammar errors. When I was making mistakes, I could correct them; thus, I could understand my weaknesses and improve them.*"*

This excerpt accentuates that virtual instruction encourages learners to be reflective, active, and critically analyze their tasks. Thus, they can better evaluate their progress.

***(d) Improved Creativity***

According to the participants, a virtual language environment can encourage learners to understand their creative potential and cultivate their creative self-efficacy. Granting students more freedom in the classroom can enhance creativity, critical thinking, and decision-making skills. Participant 14 pointed out that:

> *"While performing a task in the virtual classroom, I had more freedom of action and choice. For example, we could use any feature of the system to do the task and choose more appropriate words and sentences. This issue made us decide what strategies to use to make the task easier in the Adobe Connect environment so that we could finish the tasks correctly and on time."*

This extract highlights the fact that virtual instruction prompted the learners to choose their desired rules and strategies according to their learning styles and be more creative.

***(e) Reduced Dependence on Teachers and Boosting Learners' Confidence***

One of the major advantages of a virtual learning environment using breakout rooms is developing students' independence and providing opportunities to enhance their collaborative learning skills. Reducing dependence on the teacher and empowering learners to control their learning can significantly boost their confidence and autonomy. Participant 16 pointed out that:

> *"In the Adobe Connect class, I regularly monitored the sentences and discussions of other group members in the virtual room. And if they made a mistake, I would let them know and correct it before the teacher entered our room."*

In this kind of online learning, students generally have more opportunities to work collaboratively with their peers than in usual online learning and receive critically important instantaneous feedback from their teammates.

The examination of the excerpts mentioned above highlights the fact that virtual language instruction (through using breakout rooms) empowered the learners to use language-learning strategies

independently, increasing their ability to use language-related technological software.

In conclusion, ESP learners consider virtual language instruction an instructional approach that facilitates their language learning autonomy.

## 5. Discussion

The discussion section delves into the intricate interplay between virtual language instruction and its interaction with ESP learners' gender across multiple facets of language learning. Through a comprehensive analysis, this section explores the impact of virtual instruction on learner autonomy while also considering the influence of learners' gender on this factor.

Correspondingly, the results of the present study mirrored those from Vu and Bui's (2021) study, confirming that students had positive attitudes towards virtual learning with a focus on learner autonomy. This student-centered mode of learning focuses on student-student interaction and group work, which can expedite the learning process and encourage learners to utilize different features of the platform, such as using textbox in a whiteboard, Chat, Note, and Poll pods, screen sharing for giving answers, using a microphone to speak with each other.

Moreover, the results indicated that learners' gender, virtual instruction, and the interaction between learners' gender and virtual instruction significantly affected their autonomy. These results support the results of the studies that were carried out by Ludwig and Tassinari (2023), Mısır et al. (2018), Monica and Peter (2014), Tsai (2019), Susanti et al. (2023), and Zainuddin and Perera (2019). These studies reported that virtual language instruction significantly ameliorated language learners' autonomy in different academic settings.

Furthermore, the results corroborate the results of the studies conducted by Bugel and Buunk (1996), Chuang et al. (2018), and Paradowski and Jelińska (2023). These studies indicated that language learners' gender may influence their autonomous language learning in the process of task performance. More specifically, gender had a more advantageous effect on female learners' autonomy than male language learners.

Additionally, the results of the current study confirms Stephen et al. (2020), who stated that virtual language instruction will likely facilitate the learners' autonomous learning. As they explained, this type of instruction makes learners aware that they are responsible for their language learning and encourages them to take advantage of their

internal resources, including their language skills and knowledge, to perform their tasks satisfactorily. In addition, it holds attendees more accountable for their decisions in the process of task performance and allows them to voice their opinions without fear of being drowned out by the crowd.

Furthermore, the results of the present study corroborate the Gulbinskienė et al. (2017) study and highlight the utility of virtual language instruction for improving the participants' language skills and autonomy in their relevant settings. According to the study results, this instructional approach improved learners' reading and writing abilities in their relevant tasks and empowered them to analyze second language knowledge independently.

Based on these discussions, it can be argued that, in this study, virtual language instruction increased learners' autonomy since it forced them to rely on their internal resources (e.g., background knowledge, language learning strategies, etc.) to perform their tasks, and held them accountable for their decisions in the process of task performance, and let them voice their opinions. Furthermore, the effect of learners' gender and the interaction effect between their gender and virtual instruction on their autonomy can be ascribed to female learners' dependence on their language learning abilities and their preference for virtual language instruction.

These findings align with previous research, indicating that virtual instruction is pivotal in enhancing learners' autonomy, particularly among female learners with a stronger inclination towards autonomous learning strategies. Additionally, the study underscores the importance of learners' responsibility and accountability in virtual learning environments, where they are encouraged to leverage their internal resources and actively engage in decision-making processes. These insights contribute to a deeper understanding of how virtual instruction and learner characteristics intersect to foster autonomy in language learning contexts, emphasizing the need for tailored approaches to individual learner preferences and abilities. Concerning question two, ESP learners perceive virtual language instruction as highly beneficial for improving their autonomy, with themes including empowerment through independent learning, enhanced independence, and better-informed choices, engaging in continuous learning and being proactive, improved creativity, and reduced dependence on teachers.

Comparing these findings with existing research reveals consistent trends in the positive impact of virtual language instruction on learner

autonomy. The results echoed Gulbinskienė et al. (2017) who found that virtual instruction improved EFL learners' language skills, metacognitive awareness, and autonomy. This aligns with the current study's themes of enhanced autonomy and better-informed decisions.

Similarly, the results are aligned with Mashhadi (2022) and Ludwig and Tassinari (2023) who highlighted significant improvements in learners' autonomy and empowerment due to virtual instruction. This supports the notion of empowerment through independent learning and reduced dependence on teachers found in the current research.

In line with the findings of the present study, the findings of Susanti et al. (2023), Zhong (2021), and Yang (2016) studies revealed that motivation and peer collaboration were the most influential determinants of students' autonomy. Thus, the teacher provides numerous collaborative activities and strategies that promote students' active learning during online learning. Participants demonstrated a propensity to assume individual responsibility, but at the same time working interdependently to make collaborative decisions and reach the goal collectively.

In the same vein, the results of Lee's (2016) study on structured and open-ended tasks in virtual language instruction resonate with the current findings, as both task types ameliorate learners' autonomy. This suggests that various instructional approaches within virtual settings can contribute positively to learner autonomy.

However, while several studies demonstrate a positive impact on learner autonomy, further investigation is needed to comprehensively assess this influence in ELT contexts. Future research could delve deeper into specific aspects of autonomy, task design, and teacher guidance, to provide a more nuanced understanding of how virtual language instruction impacts learner autonomy.

In conclusion, while virtual instruction demonstrates clear benefits in areas such as learner autonomy, challenges such as technological issues remain pertinent considerations.

## 6. Conclusion

Virtual instruction through breakout rooms emerged as a potent catalyst for enhancing learners’ autonomy. Through immersive digital environments and interactive tools, learners exhibited heightened engagement. This aligns with the broader educational discourse emphasizing the transformative potential of technology-mediated learning environments.

Furthermore, gender differences have been found to significantly affect learner autonomy. Female learners demonstrated greater gains in autonomy within the virtual learning context. This underscores the need for tailored instructional strategies that take into account gender-specific learning preferences and motivational factors.

The qualitative phase enriched these findings by elucidating learners' experiential perspectives. Across thematic analyses, participants consistently praised virtual instruction for its role in fostering collaborative learning experiences, creating a sense of empowerment through independent learning, enhancing decision-making and better-informed choices, and fostering creativity.

These qualitative narratives complement the quantitative findings, highlighting the multifaceted benefits of integrating technology-driven pedagogies into ESP instruction.

By embracing innovative instructional paradigms and leveraging digital tools judiciously, educators can create dynamic and inclusive learning environments that resonate with the evolving needs and aspirations of contemporary learners. As virtual instruction continues to evolve, future research avenues could explore longitudinal effects, pedagogical adaptations for specific learner profiles, and the synergistic interplay between virtual and traditional instructional modalities. Such endeavors hold promise for fostering equitable, empowering, and effective language learning experiences in diverse educational contexts.

The study results underscored the necessity of redressing the current teacher education courses including the ESP teacher education courses in the context of foreign languages, especially in the EFL context of Iran. This overhaul process has to focus on two aspects of these courses, including the teacher educators and the course content. First, there is a need to re-educate teacher educators to provide them with adequate information on virtual language instruction and learner factors like learner autonomy and self-regulation. Second, there is a need to include certain modules in the present education courses for the EFL and ESP teachers in which the teachers are provided with adequate information on virtual language instruction and are trained to effectively utilize different learning management systems.

Furthermore, these modules need to make the pre-service and in-service teachers aware of the overriding role of the learners' gender and individual factors such as their autonomy to enable them to deal with these factors in an effective way in the process of language instruction in their classes.

Moreover, textbooks need to provide male and female learners with more information on learner factors, such as autonomy. For instance, curriculum developers can include certain sections in the textbooks that provide learners with simple definitions of these factors (e.g., autonomy) and itemize strategies for improving them in their classes.

Finally, it is essential that curriculum developers ensure that teachers are aware of the preferences and characteristics of both male and female learners. For instance, they can include certain sections in the teachers' manuals that itemize these characteristics in the form of lists of the male and female learners' overarching attributes. Institutions and educators must ensure that students have access to the necessary technological resources and provide support for any technical issues that may arise.

The study's results accentuated that EFL/ESP teachers must improve their digital literacy and increase their knowledge about virtual language instruction.

Furthermore, these teachers' ability to use different virtual instruction systems and software enables them to help their learners effectively take advantage of the relevant systems and applications. Additionally, teachers need to develop satisfactory knowledge of learner factors and utilize effective instructional strategies to address these factors effectively in the classroom.

## 7. Limitations of the Study

One significant limitation concerns the use of convenience sampling. Initially, the study included 73 participants, but post-treatment, 13 participants were lost due to various reasons such as relocation or scheduling conflicts, resulting in a reduced sample size of 60 participants. This reduction in sample size could affect the reliability and external validity of the study's findings. It is important to note that convenience sampling was not a deliberate choice but rather a necessity imposed by the structure of university courses.

In addition, the study's scope was delimited in several ways, shaping the focus and generalizability of its findings. Firstly, the study specifically targeted male and female ESP learners within the university setting, excluding participants from other language courses and diverse learning environments. Secondly, the study concentrated on investigating the impact of virtual instruction and gender on learner autonomy, omitting other significant learner factors such as motivation and attitudes. Lastly, the present study did not control for the potential influence of participants' age on the study outcomes. Given that the

research was conducted within a university setting with young adult participants, caution should be exercised in generalizing the results to other age cohorts of language learners, as age-related variables could impact the observed outcomes differently across diverse learner groups.

## 8. Suggestions for Further Research

In the dynamic landscape of language education, ongoing research is essential to understand and optimize emerging methodologies like virtual language instruction. This study delved into the impact of virtual learning on Iranian ESP learners, exploring facets such as learner autonomy. However, this investigation represents a glimpse into a vast field ripe for further exploration.

One promising avenue for future research lies in longitudinal studies that track learners' progress over extended periods. Such studies can unveil the enduring effects of virtual instruction, providing insights into the sustainability of learning outcomes. Additionally, comparative analyses contrasting virtual instruction with traditional methods offer a fertile ground for understanding the relative efficacy of different pedagogical approaches across diverse learner populations and linguistic domains.

Expanding research to encompass additional learner factors, such as motivation, attitudes, cultural backgrounds, and prior learning experiences, presents another crucial dimension.

Age-group comparisons constitute another avenue for exploration, shedding light on how different age cohorts respond to virtual language instruction. This investigation can inform age-appropriate teaching strategies and interventions tailored to the unique needs of younger learners, adults, and older individuals.

Furthermore, exploring gender dynamics within virtual learning environments is necessary and can lead to gender-sensitive pedagogical approaches that enhance learning outcomes.

Innovative pedagogical strategies like gamification and interactive simulations also warrant investigation in the context of virtual language instruction. Assessing their effectiveness in enhancing learner autonomy can inform the development of engaging and effective virtual learning environments.

In conclusion, by embarking on these avenues for further research, one can deepen our understanding of virtual language instruction, empower educators with evidence-based practices, and enhance the learning experiences of ESP learners.

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