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# eLearning 4.0 as a Sustainability Strategy for Generation Z Language Learners: Applied Linguistics of Second Language Acquisition in Younger Adults

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Abstract: The implementation of various eLearning platforms has seen an incredible and unprecedented rise in the past decade in our universities. The aim of this pilot research study is to explore the gap in second language acquisition research for technologically savvy Generation Z, whose members use modern technologies, especially mobile applications, in their learning process in a massive way. More specifically, the authors focus on students' perceptions of the use of traditional and blended learning supported by an eLearning course in order to reveal students' attitudes to and expectations from these learning modalities. Altogether, 40 university students participated in an experiment. The findings clearly show that the present eLearning platform is no longer an attractive option for students of Generation Z since these students want to participate in the creation of its content and collaborate and interact with each other in ways they are used to with other social media platforms such as Facebook. The implications of the research are important for educators and designers of various eLearning courses who need to take this into account. Further implications suggest a new approach to the exploitation of eLearning platform connected to Web 4.0. The basic principle of the new approach is to use these platforms and should harness all the possibilities of artificial intelligence, deep learning, machine learning, and computational linguistics. In conclusion, the study reflects the basic and pragmatic principles upon which eLearning 4.0 should be based in order to become a more efficient tool for modern education and sustainability.

**Keywords:** applied linguistics; psycholinguistics; eLearning; blended learning; new trends in education; online courses; language education; L2 acquisition

# 1. Introduction

The world around us has seen unprecedented changes caused by the ubiquitous use of modern communication tools and technologies [1], the spread of the Internet, and the use of mobile devices for the transfer of information. It is a truism that "culture and society develop through communication and collaboration" [2], and all these modern communication tools enable us to develop at a pace we have never experienced in human society. We have moved through the earliest writing and printing press, through mass media and early computers to the widespread interconnected network of data, stations, people, processes, ideas, and information. Communication technologies have made us dependent on vast volumes of data and information, which are omnipresent in today's world as big data utilized by business and other institutions. In fact, it is almost not possible to imagine any human global society not to be dependent on this kind of electronic information.



## 1.1. Technology in Education

Increasing technological achievements in the past decade has advanced the methodology of language education, or at least, has stimulated massive progress in educational sciences regarding the utilization of new technological tools in everyday educational processes, both in low and higher educational platforms (For statistics on blended learning see https://edtechreview.in/data-statistics/2506-blended-learning-in-the-classroom-statistics-research (accessed on 5 May 2020)). E-learning, blended learning, hybrid learning, and other forms of education with the use of electronic and mobile devices have become a commonplace in our educational institutions, and a lot of research has been conducted into the proper use and potential outcomes of these platforms [3].

In the past decade, we have experienced an enormous increase in the number of users of mobile devices, smart devices, and mobile phones so that today more than 90% of people in developed countries use some of these devices [4]. For educational specialists, this creates both a challenge and an opportunity to enhance and improve various learning processes with mostly the younger generation of mobile devices users who rely exclusively on them for their everyday communication and entertainment (For more statistics on blended and hybrid learning see https://edtechreview.in/ data-statistics/2506-blended-learning-in-the-classroom-statistics-research (Accessed on 5 May 2020)). They are also willing to use these devices when incorporated in their learning environment, and much research has been conducted on the use of smart devices in language education [5–7]. Obviously, there arise many issues with the use of modern technologies in education, and there is relatively sufficient research focusing on potential drawbacks of this trend [8–10]. We also have enough research into the use of modern technological devices in various areas of expertise and problem areas, such as Alzheimer disease, dyslexia, or medical education [10–19].

Currently, we can see very modern trends in eLearning for which we suggest the term eLearning 4.0 to comply with the very modern technological and industrial trends of Industry 4.0. For this brand-new approach of eLearning, two complementary methodologies could be implemented. The first is the one of artificial intelligence, deep learning, and machine learning with the use of computational linguistics. The second is the business model outlined and proposed by Nicolaj Siggelkow and Christian Terwiesch's paper *The Age of Continuous Connection* in Harvard Business Review issue from May–June 2019 [20]. This model, even if planned as a business model, may work not only in business context but could be applicable in education and various eLearning platforms as well [21,22].

#### 1.2. *Generations X, Y, and Z*

The categorization of Generation X, Y, and Z has been largely acknowledged but has also attracted much criticism in various social sciences and humanities research. However, we claim that the theory aptly presents findings that are easily applicable in the educational process. The members of these generations are from different socioeconomic backgrounds and it has deeply affected both their lifestyle categories and accepted values. Moreover, these generations will necessarily possess different learning styles [23,24]. Despite the necessary simplification and generalization provided by these generational categories, we still claim that they have proved useful and can be used to depict their idiosyncrasies in learning strategies when talking about various generations and their discrepancies.

For the first generation, Traditionals, born between 1925 and 1945, their learning styles are focused on the teacher in the center and the silent students around [24,25].

The following, the so-called Baby Boomers, were born between 1945 and 1964, unlike the previous generation, they have cooperative spirit and enjoy cooperation and collaboration throughout the class. Moreover, they are very focused and concentrated on hard work and achievement [26].

Generation X, born between 1965 and 1980, could be described as more autonomous during the learning process and they appreciate quick and simple instructions and also quick gains [25].

Generation Y, born 1981 to 1999, also called Millennials, are characterized by their focus on activities in groups and a cooperative environment is very motivating for them. They appreciate coaching, being led, and give regular feedback. For this study, it is important that they are the first

generation that uses modern technologies in their learning process in a massive way. This is the first generation that is connected online, and eLearning platforms are very much appreciated by them [26].

The current generation of the students and young adults who start to attend universities are the so-called Fifth Generation, or Generation Z. This generation of learners are born after the year 2000 and it is claimed to be very different from the previous generation regarding their learning styles and the use of technologies in the learning process. This is the Google generation, i.e., the generation of the students who use the Internet as the only authoritative source of information, and the Internet provides them a platform that aggregates both information and entertainment [23]. Education is therefore a synergy of information and entertainment for them.

Their immersion in technology is more or less a very natural setting for them and they cannot imagine otherwise. The direct human contact, such as in the traditional learning process, may therefore be considered by them redundant and obsolete. Furthermore, previous research shows that even the changes in their brain are significant and observable from the functional and neurological point of view, such as their attention span, multitasking abilities, and concentration [27,28]. The half-life of information trend, i.e., the time when half of the information is considered to be untrue or obsolete, is also a crucial reason for this generation to consider the fast learning process to be more efficient. Therefore, obtaining information in real time stands in the opposition to traditional ways of learning from books, teaches, and established educational institutions.

#### 1.3. eLearning 1.0, 2.0, and 3.0

The way Generation Z processes information and the impact of the use of the Internet on the students is dramatic and must be analyzed. Technology is a natural part of their lives, and it necessarily creates many issues regarding the educational process of these students. Teachers must therefore account for the fact that they have a very low resistance to being without technology and that basically all information comes to them from Internet resources. The easiest reaction of educators and creators of syllabi is to integrate some kind of eLearning or at least a minimal use of technology into the previously traditional learning process [29].

However, the catch here is that when trying to integrate various modern technologies into the learning process for Generation Z, creators of eLearning courses use these platforms as mere repositories of data, texts, videos, or tests (eLearning 1.0), assuming that this will be sufficient for the generation that is used to encountering various methodologies of artificial intelligence and deep learning in the everyday Internet world. The eLearning 2.0 focuses on social networking and collaboration, while eLearning 3.0 fully utilizes the newest findings of machine learning and artificial intelligence.

eLearning 1.0 appears to be only an initial attempt to technologize education; however, it is still present in educational institutions. This study therefore claims that there should be a serious improvement of this way of eLearning and it should be transferred into eLearning 4.0, which will utilize all the potential of artificial intelligence, deep learning, and machine learning [30]. Deep learning, machine learning, and artificial intelligence can be implemented by self-defined learning goals and by using tasks adopted automatically based on the students' previous performance, their interests, search history, history of their social network activity, etc. This is the possibility to improve the educational process significantly so that it will be competitive on a global scale. The educational process will thus be comparable with all the available online platforms that utilize these modern tools in their full potential, such as various global online retail services, and will not only present a poor and ridiculous attempt of educators to catch up with technology [31,32].

Thus, the aim of this study is to focus on students' perceptions of the use of traditional and blended learning supported by an eLearning course in order to reveal students' attitudes to and expectations from these learning modalities.

## 2. Research Methodology

#### 2.1. Participants

This study involves two groups of students, randomly divided into an experimental and control group. Both groups were tested on their knowledge of financial English vocabulary. The first group (experimental group) of 20 students were studying Professional English 2 at the Faculty of Informatics and Management of the University of Hradec Kralove, Czech Republic, using blended learning, i.e., a combination of traditional methods with an eLearning course. The eLearning course that was conducted using the Blackboard learning platform utilizing all the most important tools that this platform provides, i.e., a communication tool with the participants, homework assignments, learning modules through which the teacher can provide texts and lectures, links to other sources, or a study guide explaining basic information about the course design.

Students participated in the course for one semester (12 weeks from September to December) every week for 90 minutes with one-week spent on eLearning activities and one week physically attending a traditional classroom environment (90 minutes a week). The second group of 20 students of the same subject was a control group with only a traditional classroom environment, i.e., every week 90 minutes in the classroom using a traditional textbook and no eLearning. Both groups were equally divided between male and female numbers who were aged between 19 and 20 years. Their English level was very similar, namely B1 or B1+ (i.e., intermediate level of English), according to the Common European Reference Framework for languages (CERF) [33]. Both groups were taught by the same tutor and they shared the same learning content. The focus of the class was on business vocabulary development based on the textbook of Ian MacKenzie *Financial English with Financial Glossary* [34]. The tasks were varied; however, all of them focused on vocabulary acquisition through various forms of revision and repetition, such as fill in the gaps, find appropriate word pairs, collocations, etc.

Before the survey itself, all the respondents were asked if they agreed with the survey and they were informed about the fact that the data collected will be confidential and the research will not collect any private data about the research participants.

#### 2.2. Study Design

Since the sample of subjects is relatively small, this is a pilot experimental study into the research issue. The quantitative data were collected through an online questionnaire at the end of the semester on the students' satisfaction with the course. The aim of the research was to collect the data from both groups and compare the results to see the potential problems and questions arising from the use of eLearning platform. The control group, i.e., the group without any kind of eLearning, was expected to be less satisfied with the traditional learning process. This expectation was based on a generally accepted model that eLearning will necessarily be more attractive for Generation Z because this generation likes mobile technologies and will therefore create a feeling of improved satisfaction.

The initial vocabulary knowledge of the students was tested by a vocabulary test at the beginning of the semester. Moreover, a traditional semester test was conducted at the end of the term to test the vocabulary knowledge in both groups. The contents of the classes were identical, the only difference was again the use of the technology enhanced learning vs. no technology. Based on the literature [35–38], we expected better results in the group using eLearning in their vocabulary performance. The above-mentioned literature describes very optimistic results when using mobile apps in the improvement of communication skills. Therefore, we could conclude that the general positive impact of mobile devices or any kind of eLearning will come as well. The purpose of the final test was to determine whether the groups with eLearning classes would reach better or comparable results. The vocabulary retention test was based on a simple translation method, i.e., to translate the word into Czech or into English, also fill-in-the-gaps exercises were used. The students were also supposed to choose one correct definition of the word out of several definitions.

#### 2.3. Hypotheses

Two hypotheses were created in relation to the research described above:

- 1. The control group will have worse results in the overall satisfaction with the course.
- 2. The control group will have worse results in new vocabulary retention.

Meanwhile, the control group adopted the traditional vocabulary learning approach. This meant that the participants went through the article provided in the textbook and they were supposed to find out and explain the meaning of the target words by using a dictionary. The control group was requested to review the target words through finishing the exercises in the textbook and workbook, including answering the questions, matching the definition, and filling the gap. In the next lesson, both groups were tested on their vocabulary achievement. The data from the experimental group and the control group were collected, the results were compared, and they are described below.

## 3. Results of the Research

## 3.1. Hypotheses

Neither Hypothesis 1 nor 2 were confirmed. Despite the general opinion that eLearning almost inevitably brings enhanced performance and mostly Generation Z will yield the biggest benefits from these new methodologies, the research did not prove any significant difference in vocabulary retention in both groups. Moreover, the expected increased satisfaction with the possibility to be online and use eLearning by the students who belong to Generation Z was not supported and rather on the contrary, the students expressed their concerns regarding the use of technology in the language education.

# 3.2. Results

The differences observed in relation to satisfaction and vocabulary performance retention test are not statistically significant, and therefore the hypotheses cannot be confirmed. In other words, the use of the eLearning activities did not have any significant impact on the improvement of the general satisfaction with the course. The integration of the eLearning platform in the learning process did not have any significant impact on the improvement of vocabulary retention. The biggest concern reported by the users of the eLearning platform was the fact that it only increased the time they spend on the computer. Social media and other kinds of entertainment occupy a significant amount of the students´ free time and adding more screen time on directed learning is not seen as a benefit. The participants of the research expressed their interest in using the eLearning platform as a tool that could enhance their communication and connection with other participants of the course. However, the majority of them wanted to increase the time they spent in the class with the teacher and the direct interaction both with the tutor and other students was highly valued.

Regarding Hypothesis 1, the questionnaire generated the following results (See Table 1 below).

<b>Table 1.</b> Overall satisfaction with the course of	the experimental	l group and the control	l group
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Group	Overall Satisfaction with the Course	Satisfaction with the Traditional Class Education
experimental group	87%	91%
control group	81%	81%

Regarding Hypothesis 2, the questionnaire generated the following results (See Table 2 below). The pretests and the post-tests were identical, and their intention was to evaluate the initial level of the participants of the experiment. As can be observed, the experimental group's results stood at 12%, i.e., their initial knowledge was quite limited in comparison to the control group's pretest knowledge, which was higher, but not significantly so as to have a negative impact on the overall findings. Their lower initial vocabulary knowledge can be explained by the nature of specialized vocabulary for professional finance used in the test, which even for advanced learners of English (B1-C1) could be deemed difficult. The aim of the course was to dramatically improve professional knowledge of this specific area of English, i.e., Finance English vocabulary.

**Table 2.** A comparison of the two vocabulary test scores between the experimental group and the control group.

Group	Pretest Vocabulary	Post-Test Vocabulary	Differences between
	Score	Score	the Two Tests
experimental group	12%	65%	53%
control group	21%	71%	50%

The vocabulary post-test contained a few questions regarding the suggestions for improvement of the online course. The students could choose from a list of improvements in the eLearning course. Despite their subjective opinions on the improvements, their opinion can be used as a very useful tool and should be seriously considered when modifying the course. The results are summarized in Table 3 below and discussed in the next section.

Table 3. Experimental group students' suggestions regarding the improvement of the online course.

Suggestion	Total Percentage
More collaborative tools to improve communication	76%
Implement social media such as Facebook and Twitter or Instagram	65%
Reduce the screen time necessary to spend with the eLearning course	53%
Use Youtube more	51%
Use more videos	43%
Reduce the long written texts	27%

# 4. Discussion

The findings of this study show that the use of the eLearning platform did not generate better results in learning English vocabulary in comparison with traditional classes. The results may have been partly skewed due to the lower level of students' English in the experimental group, as indicated by the vocabulary pretest. The main reason, however, which can be inferred from the responses to the questionnaire, and is corroborated by previous studies alluded to earlier, is that the eLearning 1.0 is no longer an attractive option for students of Generation Z. These students want to participate in the creation of its content, collaborate, and interact with each other in ways they are used to with other social media platforms such as Facebook [30]. Furthermore, they expect immediate feedback and answers to their questions [39]. They are very fast on one hand, and on the other, very impatient in performing their task. The impatience of the students is caused by many factors, such as their exposure to many stimuli, and the human brain develops permanent fatigue leading to reduced concentration and increased impatience [40].

All these factors must be then taken into account in the design and preparation of any eLearning course. Furthermore, the teachers must be available to respond to students' needs on the spot if they want to retain their students' high motivation for learning a foreign language. They must prepare such a course, which is technologically appealing to them and corresponds to their level of English [40], as well as ensuring connectivity within the group [41,42]. In addition, they should encourage the students to see the potential of new technologies and to see the potential of becoming a personally empowered learner with the possibility of becoming part of an online community [43].

New trends of eLearning and blended learning are a big challenge for curricula creators and designers of these courses since they present a great opportunity for improved educational process but also, as the research has shown, a threat. Obviously not all parts of the world are equal in this

challenge; in some countries there are contextual constraints due to the education systems and the resources available. But generally, the designers of curricula will face these challenges and have to cope with them very soon.

The adoption of these technologies in the educational process is weakened by the lack of training of teachers who may not be as familiar with these applications as their students, and their lack of professionalism is viewed as a dramatic fault by the students. This study attempts to highlight these opportunities and also draw the attention to the challenges so that educators may be able to create appropriately relevant and more efficient online courses that respond to Generation Z's needs. There is also relevant research into the use of mobile devices and the deployment of cognitive and affective components for teaching languages in a blended learning university setting [44–47], which must be taken into consideration for further research. The current research [1,48] confirms the importance of the implementation of social media and other kinds of interactivity into eLearning platforms because social linkages are crucial for Generation Z and lead to their deeper involvement in the educational process [48].

There are obviously several limitations to this research, such as a small subject sample or slightly different level of students' English. The small number of respondents may have affected the results obtained; however, we claim that it still brings significant findings that are counterintuitive and also slightly opposing the current literature mentioned above. This is only a pilot study into the use of eLearning, and further detailed studies should be conducted on a larger scale to generate more statistically valid and relevant data, which could be generalized.

#### 5. Conclusions

This study attempts to highlight the fact that current eLearning aspects of language courses cannot be identical to eLearning a few years ago. Even though methodologically it is a very new approach to education, the progress of technology is so dramatic that it cannot be ignored [49].

The findings of this pilot study clearly show that the present eLearning platform is no longer an attractive option for students of generation Z since these students want to participate in the creation of its content, collaborate, and interact with each other in ways they are used to with other social media platforms such as Facebook.

Anything that was implemented a few years ago into eLearning is now not functional in the ways it was a few years ago due to dramatic changes in the way information is processed [50]. eLearning 3.0 with the use of machine learning, deep learning, artificial intelligence on one hand, and business models on the other, could create platforms that would be functional and very efficient not only in language acquisition (mobile assisted language learning) but any kind of mobile assisted learning process [39]. eLearning 1.0, 2.0, and 3.0 brought new approaches to education with the use of computers and screens; however, if the creators of new apps and educational software stick to the same principles of traditional eLearning, they fail as educators and the students are demotivated, which will lead to decreased competitiveness and results. On the other hand, eLearning 4.0 brings together all the known and up-to-date technology, which is now widely used in business, marketing, and sales, and there is no reason why all these potentials of new technology should be restricted to the area of business and not made available to language educators for the benefits of their technologically savvy students.

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