

ORIGINAL RESEARCH PAPER

THE RELATIONSHIP BETWEEN DIGITAL COMPETENCY, LEARNING STYLES AND LEARNERS' PERCEPTION OF TRADITIONAL VERSUS TECHNOLOGY-ASSISTED LANGUAGE LEARNING

Lamija Huseinović 

International Burch University, Sarajevo, Bosnia and Herzegovina

Correspondence concerning this article should be addressed to Lamija Huseinović, International Burch University, Sarajevo, Bosnia and Herzegovina. E-mail: lamija.huseinovic39@gmail.com

ABSTRACT

The face of education is bound to be reshaped due to the changing needs of students, imposed by new and emerging technologies. The educational system has been stuck in time for generations, and while some improvements have been made, there is still a long way to go before the means of teaching and learning entailed by educational programs and institutions is fully adapted to the new digital age and learner profiles. There are numerous benefits of incorporating computer and mobile tools in the teaching and learning methods and its effectiveness has been demonstrated through numerous studies, some of which are referred to in this research paper. Technology allows students and teachers to interact and engage in creative ways through a digital environment that enables students of divergent learning styles to simultaneously learn lessons in a personalized manner that will ensure successful learning and performance. This research presents the results of a survey conducted with 50 learners in Bosnia and Herzegovina, between ages 18 and 47, which was conducted for the purpose of exploring relationships between digital competency, learning styles, and learners' attitudes towards traditional versus digital means of education. The research found that there is a strong preference for technology-assisted learning where participants primarily chose video as a learning medium, followed by voice recordings, music, podcasts, and practical use of the language with native or highly proficient speakers of the language learned. The study results, therefore, suggest a necessity for the application of an eclectic approach in education.

Keywords: digital competency, learning styles, technology-assisted learning, online learning, modern teaching methods



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1. Introduction

The application of technology in education systems has become an inevitable necessity in modern society and its proper integration has been an issue that has encouraged intensive research, as well as rich dialogue among professionals, in the academic sector. Due to the presence of technology in both private and professional life around the world, the search for knowledge has adopted a new form and changed the learning styles and needs of students. For thousands of years, children have been taught through self-directed play and free exploration, but industrialization has suppressed this mode of learning by imposed labour. Finally, the principles applied in the workplace have been transferred to educational institutions and learning has been standardized, modeled, and abstracted from real environments (Gray, 2008).

Since the emergence of new technologies, learning through play has been reignited with numerous forms of entertainment of educational nature; video, audio, games and so on. Technology has become so integrated in society that a large percentage of the global population has smartphones, computers, laptops, smart pads, smart watches or other devices and gadgets. Thus, the integration of technology in education has become imperative, since new generations of learners are born into an age of technology and most spaces that are deprived of it or insufficiently adapted to it are considered unappealing to them. This problematizes effective capacity building of learners that will form them into knowledgeable, skilled, responsible, and contributing members of society.

With the migration of many everyday tasks to a digitized space, education has changed its form in some respects, but this trend was especially prompted by the COVID-19 pandemic in 2019. Due to great health risks, the shift to online education was made by necessity and it opened a whole new frontier demonstrating the possibilities of technology-assisted learning, which allows a fluid approach that is not bound by time and place in the manner it used to be. The possibility of education in an online space has provided an opportunity for the exploration of its capacity for providing educational content using innovative ways of communication and interaction with learning material. Online learning has also allowed schools and universities to teach students from all over the world, making educational programs more available, which both learners and institutions can benefit from. An online

educational program allows for a greater number of enrollments and students per class, and it allows students to have more options and greater freedom of choice when it comes to their studies. However, due to the earlier insufficient level of integration of modern technology into classrooms, issues have emerged as a result of the global pandemic that forced a complete shift to online teaching, learning and assessment. Unprepared students and teachers reported experiencing a high level of academic stress due to this novel model of work. In a qualitative study conducted by Francisco et al. (2022), it was found that some of the major factors causing students to be academically stressed included: overwhelming academic workload, an uncondusive learning environment, role conflict, and adjusting to the new mode of learning, among others. Dautbašić and Bećirović (2021) argue in their research on teacher and student experiences in online classes during the COVID-19 pandemic in Serbia, Bosnia and Herzegovina and Croatia, that these countries have to make radical changes in order to meet the demands that will be imposed by the inevitable evolution of digitalization and thus online education.

This paper will analyze the possibilities and requirements of online learning, the relationship between digital competency and online learning, the effectiveness of online learning, the relationship between learning styles and online learning, and the effectiveness of computer-assisted and mobile-assisted learning.

2. Literature review

2.1. Online learning

Online learning can be defined as: "[t]he use of the Internet to access learning materials; to interact with the content, instructor, and other learners; and to obtain support during the learning process, in order to acquire knowledge, to construct personal meaning, and to grow from the learning experience" (Ally, 2009). The use of digital technology entails mixed learning methods through the use of divergent media forms such as video, audio, texts, graphics, animations, simulations, and other, as well as platforms such as Youtube, Zoom, WorldClassroom, Google Meet, Slack, learning management systems, digital libraries and similar. In this manner, learning is facilitated, since it allows options such as repetition of material, practice, learning at one's own pace, using supporting materials of students' choice that will help with understanding, and so on.

This helps to support teachers in their teaching process, since students who need further explanation can also work autonomously on lessons and improve their acquisition of knowledge in a personalized manner (Hasifa, 2020; Wan Aziaris, 2015).

For online education to be effective, there are certain requirements that need to be met to ensure knowledge transfer and successful acquisition. Bonk and Reynolds (1997) argue that it is imperative for online learning to include challenging activities that promote higher-order thinking and require the connection between old and new information and use of metacognitive abilities. According to Meinchenbaum (1985), metacognition is one's awareness of acquired knowledge or that which has not been previously attained. Thus, the concept relates to the ability of the learner to comprehend and manipulate cognitive operations. For instance, learners are engaging in metacognition while planning their approach to solving a task, reflecting on the final result, self-assessing, self-correcting, and adapting their steps and approaches to learning for ensuring successful completion. Flavell (1976) was the first to use the term metacognition and he explained it in terms of awareness of blockades in learning, evaluation of approaches to task-performance, and awareness of one's own thinking patterns. He divided the metacognition into three categories:

Person variables: personal characteristics in learning and information processing recognized as strengths or weaknesses;

Task variables: characteristics of the nature of the task and the demands for completion that the learner identifies as requirements

Strategy variables: schematized strategies, previously encoded knowledge, that can easily be activated to apply in task completion.

An example is provided by Livingston (1997) who described the applications of the three variables by stating: "I know that I (person variable) have difficulty with word problems (task variable), so I will answer the computational problems first and save the word problems for last (strategy variable)." (p. 5)

In the context of the requirements identified by Bonk and Reynolds (1997), they also argue that instructional strategy affects the quality of learning more than technology. However, Kozma (2001)

provides a somewhat different view by stating that the medium does impact learning and technology, particularly referring to computers, is in fact needed for real-life simulations and model-presenting that help students get a better understanding of the learning material. Clark (2001) argues that the computer is a vehicle that creates a space for students to be delivered instruction and to be able to process information in an effective way. Cole (2000) also presents a favorable case for online learning by describing it as a means for collapsing time and space due to the flexibility that it provides in terms of access to learning materials. However, Cole highlights the importance of the role of teachers in designing effective learning materials that are appealing to students and elicit interest in the learning process. Rossett (2002) shares Cole's point of view by reiterating the significance of "proper design" when it comes to materials and instruction provided, and the support system that should all be tailored to student's needs. The need for high authenticity in learning was identified by Ring and Mathieux (2002), who brought forth an argument for designing learning in the context of the workplace, which would build the capacity of students in a more practical manner, and for the integration of highly interactive activities to strengthen the ability for collaboration.

Ratheswari (2018) considers that information technologies are crucial for students learning in the 21st century as it will prepare them for their entrance into the professional world as digitally literate, skilled and adaptable individuals. Cachia and Ferrari (2010) argue for technology-based education via creative means that will facilitate learning and interactions between peers and teachers.

2.2. Digital competency and online learning

Life has become almost inconceivable without computer technology, as society has largely turned to digitization for everyday tasks. The knowledge and skills needed to use information technology and computer technology have become one of the biggest requirements in today's professional world. The aim of facilitating faster, more efficient and flexible operations, problem solving and training has promoted and opened the possibility of integrating various forms of entertainment in education through video and games. The advent of information technology has revitalized the ability to learn through play. With the widespread use of ICT, digital competence in education, as well as in

others, has become a necessity. Ferrari (2012) presented the seven basic skills that teachers and students should have in the modern educational environment:

1. Information management: locating, accessing, retrieving, storing and organizing information in the digital space;
2. Collaboration: the ability to connect with others in the online space and interact in a constructive manner;
3. Communication and sharing: using online tools to communicate with others in the digital space;
4. Creation of content and knowledge: the ability to integrate previous knowledge, re-elaborate it and create new knowledge;
5. Ethics and responsibility: the ability to responsibly use ICTs and to follow the legal framework that applies to the digital space;
6. Evaluation and problem solving: to identify and solve problems using digital tools;
7. Technical operations: the ability to use media and digital tools.

The emergence of new technologies and their introduction into the school environment has changed the conventional understanding of education. In previous years, both teachers and students had to be present in the same physical space to communicate directly, while the teacher had to apply specialized teaching methods in classrooms so that students could interpret and internalize the concepts transmitted. As a result, this framework is characterized by the synchronization of students and teachers, in which both must coincide in time for teaching to be successful (Requerey, 2009). Presently, the need for physical education has been eliminated, and students are no longer limited to the classroom so that learning can take place. By integrating computer-assisted learning and mobile-assisted learning, students are able to tailor their own learning model according to the curriculum and their circumstances and skills. According to Danilović and Danilović (2012), information and communication technology is "a symbiosis of technology, methods and tools that together enable the transfer and use of educational content in accordance with the needs of educational actors, their intellectual capacities and teaching goals."

This has led to better participation in courses and a greater interest in educational materials. Education can be further transformed at all levels, with the full application of technology in education and adequate staff training (Sangra & González-Sanmamed, 2010). The roles of teachers and students have already changed to some extent, with new opportunities for autonomous learning and easy access to information from around the world. However, this change can be further enhanced and developed with new information technology and computer and mobile-assisted learning, to provide students with even more independence and space for personalized learning with continuous practical experience. It is necessary to consider, as presented in research done by Bećirović and Dervić (2022) on student's perspectives of digital transformation of higher education in Bosnia and Herzegovina, that student's preference of learning mode (hybrid, online or live) impact their preparedness for e-learning, attitudes and satisfaction among other, which are crucial factors to discuss when planning for digital transformation and the advancement of educational programs and strategies.

The study presented in this paper aims to aid this purpose and investigate the relationship between digital competence, learning styles and the effectiveness of computer and mobile learning, especially in terms of improving language acquisition.

2.3. The effectiveness of online learning/online language learning

A study by Kiliçkaya and Krajka (2010) found that students remember their new vocabulary better when learning online. The main aim of their research was to compare the effect of different learning contexts on vocabulary learning. The two contexts examined are online and traditional learning. Participants in the control group (20) practiced new vocabulary from texts using notebooks and word cards, and participants in the experimental group (18) studied the same vocabulary through WordChamp - an online educational site. The researchers reported better memory performance in the experimental group after the test results were obtained three months after the experiment.

Another study investigating the effects of ICT on language learning was conducted by Ahmad (2016). The aim was to determine the relationship between ICT and skills. The experiment was based on an analysis of how modern ICT tools affect the

learning and speaking skills of a new language, as well as the construction of vocabulary and grammar knowledge. The survey was conducted with 100 English students from King Abdulaziz University. Participants in the control group, who used traditional methods, and in the experimental group, who used technology, were between 18 and 25 years old. The team that used the technology demonstrated a greater ability to use language learning in real situations and improved listening and speaking skills. Participants who used the technology showed better results in terms of pronunciation accuracy, vocabulary range and grammar knowledge. Therefore, the researcher concluded that technology has a significant impact on learning in a positive way, in which students are able to acquire new information and encode it more efficiently in long-term memory than when only traditional means are used.

Murnani and Salehi (2015) investigated the use of online dictionaries and the extent to which they improve the learning of different forms of language. 100 children participated in the experiment. The researchers divided the participants into experimental and control groups to investigate the effectiveness of using digital vocabulary to obtain words or phrases. During the learning sessions, the participants in the experimental group learned language forms using an electronic dictionary, while the participants in the control group took classes in the classroom using traditional methods. The study's findings suggest that learning using digital dictionaries significantly improves the learning of words and phrases.

Further research supports the application of technology in learning and online learning. Navarro and Shoemaker (2000) found that online students have equal or better results than traditional students, and that students are more likely to enjoy online learning regardless of their background. Rovai and Jordan's (2004) study of the relationship between social class and integrated form of learning found that students who use technology for online learning have a stronger sense of community. Several studies also demonstrated that through online learning, game mechanics and virtual successes increase engagement and reduce attrition (Dittering et al., 2011; Huatari & Hamari, 2012). The results from research conducted by Chen et. al. (2007) found that online learning allows for divergent teaching approaches that address various learning styles of students. Learning provides an opportunity for edutainment, which can improve academic performance due to higher interest

and motivation for engaging in the learning process (Nguyen, 2015). Kenney and Newcombe (2011) found that blended learning resulted in higher average grades compared to a traditional learning environment. Garrison and Kanuka (2004) found that students are more likely to complete courses that employ a blended approach to learning than those who do not. They also found that student retention and satisfaction are improved through this teaching method. Research conducted by Bećirović et al. (2022), on student online learning satisfaction, interaction, self-efficacy and self-regulated learning, found that there is a direct positive correlation between learner satisfaction, time spent online and student GPA. Thus, the researchers concluded that "[o]nline learning is progressive and more resistant to certain outer factors. It is a contemporary way of communication and, as a powerful tool in education, it deserves more attention from educators" (p.30).

Research is largely in favor of ICT applications in educational institutions and other learning environments. However, it is extremely important to remember that for the use of technology to have fruitful effects on education, there are two key issues that determine student success and that need to be addressed in the curriculum reform process – technological competence and learning styles. Technological competence is examined in this study with regards to the seven competencies offered by Farrari (2012). Technological competencies refer to skills and competences acquired through the repeated use and exploration of digital tools and applications and are largely based on trial and error. As technological innovations evolve, so do the requirements for developing new skills. The strength of one's ability in this regard depends on repetition and correction. Ability is not a predetermined feature, so it can be manipulated and improved.

2.4. The relationship between online learning and learning styles

"Learning style" refers to the student's learning systems or learning preferences or memorization of knowledge and information. Learning styles are classified into four learning modes: auditory, kinesthetic, visual, and reading and writing. When it comes to learning styles, they depend on students' psychological patterns and attitudes about the most effective way to interact and receive new information. An individual's learning style depends largely on his or her psychology, so teachers are not able to control this variable during knowledge

transfer. A student with an auditory learning style cannot spontaneously change his style and develop the ability to learn faster by reading and writing. A student's learning style has a great influence on his or her performance on tests based on learning methods that differ from the dominant one. Therefore, assessments can give uncertain results that do not realistically reflect students' level of skill and knowledge. The education system still does not satisfactorily integrate flexible learning methods to suit the needs of students and the four learning styles (Lucas, 2004). However, it is important to keep this in mind when looking at the future of digital education, which offers ample opportunities and greater freedom for teachers and students.

Auditory types learn best while engaging in group discussions, listening to music, sounds, cassettes, or by reading aloud (Lucas, 2004). They learn majorly by talking and listening, and such students have a strong preference for oral assignments (Sprenger, 2002). To meet the needs of listening students, auditory stimuli such as music, conversations, interactive CD-ROMs, recordings, or demonstrations with verbal explanations should be included (Lucas, 2004). The challenge faced by most students with this learning style is having to be quiet and still.

Students with a visual learning style prefer to learn through visual aids such as posters, drawings, images, charts/maps, pictures, colors, visualization (Lucas, 2004). They may not fully grasp verbally discussed concepts, but they will "see" what is being said (Sprenger, 2002). Visual students are oriented towards creating visual representations of material being studied to encode information. Visually lenient students appreciate colored papers, graphically presented information and analogies related to the topic of the learning session, using cartoons for instance. Video plays a large role in this learning style, as it helps in the process of visualization of the progression and the relationships between concepts (Lucas, 2004).

A kinesthetic learner is best engaged in learning through activities and practical performance such as through gaming, movement, objects, modeling, and excursions (Lucas, 2004). This learning style requires movement and action, which is why students with this style have the most challenging time in traditional classroom arrangements and approaches to teaching that impose a style based on listening and note-taking (Sprenger, 2002).

The traditional education method is highly based on auditory and reading/writing learning styles which places students with different styles at a disadvantage. In a digital space, learning can take on a form that suits all learning styles and addresses their needs through applications such as virtual reality (VR), educational games, movies, music and so on. Learning in a virtual space enables the creation of an appealing visual representation of the study material through simple designs that are easily navigated. The compatibility of educational methods with students' learning styles highly affects academic performance as well as skill development. Remaining stuck in the old ways of knowledge transference and not adequately adapting the education system to the diversity of student needs and learning styles is hampering the progress of society.

3. Methodology

3.1. Research Objectives

Considering how digital competency and learning styles have a significant impact on the learning process, this research aimed to explore the relationships between age, gender, different aspects of digital literacy and students' perception of the efficiency of computer and mobile-assisted language learning in terms of boosting learner's motivation and language acquisition. The study also analyzes attitudes of participants in terms of traditional and digital/online learning based on gamification and relationships with the consideration of variables such as attention span, type of learning content, and students' needs.

3.2. Research questions

Previous studies conducted on the role of information technology on foreign language learning as well as on digital competency depended on the region where the research was conducted. Similar studies were not conducted in Bosnia and Herzegovina which is why different variables were considered and several research questions are stated as following:

RQ1: What is the relationship between learning style, content form preference, age, gender and digital competency?

RQ2: What is the relationship between attention and frequency of use of technology for language learning?

RQ3: What is the relationship between self-rated ability for autonomous use of technology for language learning, style of learning and attitude towards traditional versus new technology methods of learning, as well as their potential for boosting motivation in language learning?

3.3. Instruments and procedures

The research conducted primarily aimed to explore the relationships between digital competency, learning style needs, gender, attention capacity, type of learning material, attitudes towards online and traditional learning, and age using an online survey composed of 21 questions pertaining to relevant educational experiences of students. The variables measured in the survey are: learning style, content form preference, age, gender, digital competency, attention and frequency of use of technology for language learning. The questionnaire was obtained from Coman et al., 2020. The survey was written in Bosnian and English. The questionnaire is of structured nature, with close-ended questions and it was distributed via social media and snowball sampling. A sample of 50 participants was collected. Data was processed using SPSS software and Excel operations to perform statistical analysis.

3.4. Participants

The sample consists of 23 males and 27 females, which means the percentage ratio is 46:54. The proportion of the genders in the sample is close in number, therefore there is an overall balanced representation. The participants who took part in the research are between 18 and 47 years old. The age range is 29, while the average age is 27 years old. It is also the most represented age in the group. Participant demographics are diverse and mostly include high school and university students, as well as persons who are no longer in the education system, but have graduated and are employed. The majority of the sample are students from public universities in Bosnia and Herzegovina. The average questionnaire participant has graduated from high school and is in the first or second cycle of studies in university.

4. Results

45 out of 50 have used a computer or mobile phone for language learning, while 5 out of 50 did not. However, the sample contains a variety of degrees in digital literacy. When it comes to learning style, the majority of participants are visual

learners (44%), 26% are textual learners, 16% are auditory learners, and kinesthetic learners make up the smallest percentage of 14%.

Chart 1.

Representation of learning styles in the sample

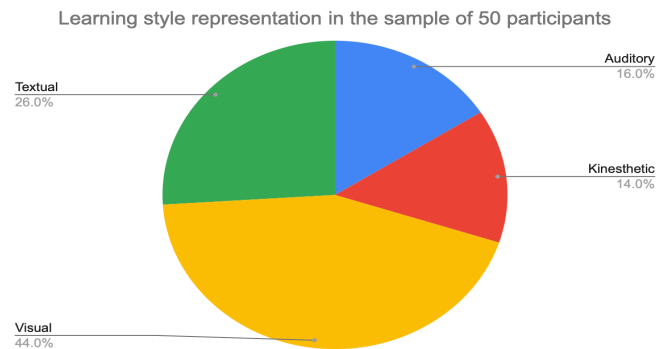
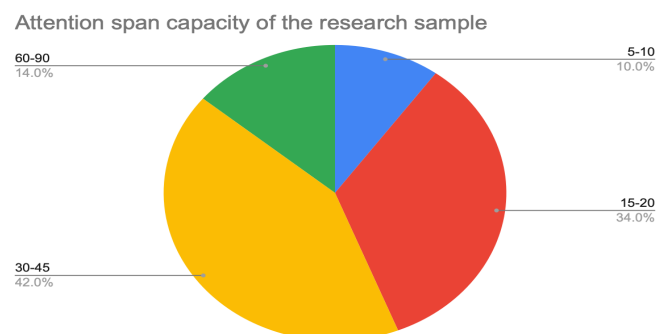


Chart 2.

Attention span capacity in the research sample (in minutes).



From chart 2. it can be seen that the majority of participants, 42%, have an attention span of 30 to 35 minutes, and 34% 15 to 20 minutes. 14% have the capacity to focus on one type of content for 60 to 90 minutes, while the last 10% have only the capacity to focus for 5 to 10 minutes at a time.

4.1. Digital competency

When it comes to digital competency or literacy, participants were asked to rate their abilities in using digital tools in terms of connecting, communicating, and collaborating with other users in the digital space, applying knowledge and creating content, identifying and solving problems, autonomously learning languages, and they were asked to rate their familiarity with their rights and those of others in the digital world on the scale from "poor" to "excellent". They were also asked to rate the frequency of their use of computer or mobile technol-

ogy for language learning on the scale from “never” to “very often”. The results showed that 34% of participants use technology for language learning very often, 30% use it often, 28% use it sometimes, and 8% rarely use it. When it comes to self-rated ability of using language learning technology autonomously, 52% of the participants rated their ability as “excellent” meaning that they feel comfortable using technology without needing assistance and guidance by a trained or highly experienced user. 28% of participants rated their ability as very good, 16% rated it as good, and 2% percent rated it as insufficient and poor each. In terms of self-rated ability of using technology for connecting and collaborating with users in the digital community, the participant sample is overall confident in the ability to use technology for connecting and collaborating with users in a digital environment, where 50% consider themselves proficient in it, 26% consider themselves to be very skilled, 20% rate it as good, and only 4% consider it not good enough. With respect to using digital tools for communication with others (such as Zoom, WhatsApp, email, etc.), the participants’ self-rated ability for communicating with others using tools such as email, Zoom, WhatsApp, Viber, and similar, showed that confidence level is high in the sample, with 56% rating their abilities as excellent, 34% rating it as very good, and only 8% as good enough and 2% as poor. Most of the participants rate their abilities to apply knowledge and create content using technology as quite high, with 38% rating it as excellent and 48% as very good. A smaller percentage rate their abilities as good, 4%, not good enough, 4% and poor 6%.

Participants seem to have a good understanding of their rights in the online community, which is an interesting finding since laws applied to the digital space are constantly being developed and adjusted. The management of events in the digital world is highly challenging as a consequence of its availability to a large population, the ease of access, freedom to create and manipulate content of diverse nature, the difficulty of tracking users due to availability of virtual private network programs (VPN), anonymous accounts, the creation of alternative “dark” networks with complex algorithms that scramble the digital footprint of a user, making it impossible to track those who violate digital laws. In this sample, 18% of participants rate their level of knowledge as excellent, 42% as very good, 18% as good, 10% as not good enough, and 12% as poor.

Self-rated ability of the group for troubleshooting using technology is quite high as well, with 48% rating it as excellent, 30% rating it very good, 10% as good, 6% as not good enough, and 6% as poor. When it comes to self-rated level of technical skills, participants’ responses reveal that, on average, the sample would position themselves as overall very skilled in technology use. 28% rate the sum of their abilities as excellent, 48% as very good, 18% as good, and 6% as not good enough.

90% of the group reported that they have had some experience with computer and mobile-based applications for language learning, while only 10% have not used language-learning applications before. The answers reflecting satisfaction with the experience of using digital media for language learning show that the satisfaction rate is significantly high. 62% rate it as excellent, 20% as very good, 10% as good, and 8% as poor.

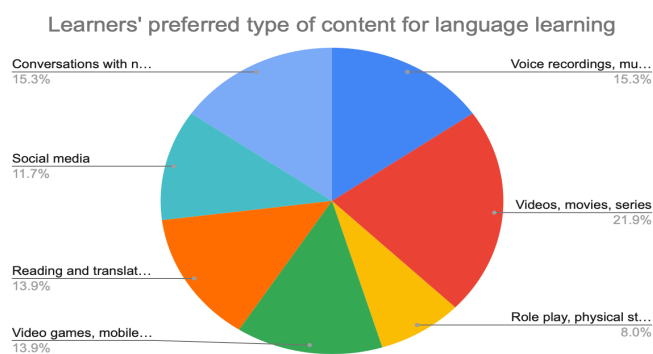
4.2. Student needs and attitudes towards traditional versus online teaching and learning methods

Table 1. and Chart 3. show the format in which the sample of learners prefer to engage with language learning. The participants were allowed to choose several answers and all have selected more than one type of preferred learning content. The content that is most preferred by the sample group is in video form, such as movies and series. This option was selected by 30 out of 50 individuals. The second most preferred content forms are voice recordings, music, podcasts, and practical use of the language with native or highly proficient speakers of the language learned. Reading and translating texts and video games share the third place when it comes to their popularity among learners, with 19 out of 50 total picks, which makes 13.9% of the sample. Social media is preferred by 16 out of 50 participants, which makes up 11.7% of the sample, while role play and physical stimulation were preferred by 11 participants, 8% of the sample.

Table 1.
Learners' preferred type of content for language studies

What content do you prefer for language learning? (several answers possible)		
Content type	Frequency	Cumulative percent
Voice recordings, music, podcasts	21	15.3
Videos, movies, series	30	21.9
Role play, physical stimulation	11	8
Video games, mobile games (narrative, memory, crossword puzzles ...)	19	13.9
Reading and translating texts	19	13.9
Social media	16	11.7
Conversations with native speakers or with those who speak the language with high proficiency	21	15.3

Chart 3.
Preferred type of content for language learning in the research sample



Participants were provided a list of needs from which they could identify their own in the context of language learning. Several answers were possible and all participants chose more than one answer. Table 2. and Chart 4. show the representativeness of identified student needs in the sample. The need that was selected by the largest number, 28 out of 50 or 15%, is fast feedback on progress. A close second is proper instructions on how to learn, with 27 out of 50 picks or 14.4% of the sample. Creative tasks, momentary correction of mistakes and the ability to repeat lessons are in third place in terms of learning demands of the sample group. 18 out of 50 participants selected flexibility in terms

of times and modes of learning as a major need, which makes 9.6%. Entertainment and momentary application of lessons was chosen by 16 individuals each or 8.6%. The least selected needs were a fixed schedule of lessons and physical stimulation, which make up 7% and 5.3% of the sample respectively.

The participants were asked to rate the traditional approach to learning in terms of its satisfaction of their aforementioned student needs. When considering the traditional approach, participants were provided an explanation of what is meant by the term in brackets, which includes: classroom lectures, abstract presentation of concepts, learning from a book and so on. 20% of participants rated the method as fully satisfying their student needs, 32% rated it as satisfying most of their needs, 24% rated it as sufficient but not ideal, 16% rated it as not sufficient enough, and 8% rated it as completely insufficient. When asked about the satisfaction of identified student needs through the use of mobile and computer-assisted learning, 52% of the sample rated the method as being fully satisfying in terms of their needs, while 36% rated it as satisfying and 12% as sufficient. Furthermore, participants were asked to express their perception about the future integration of gamified language learning materials and their belief about its effect on the improvement of their knowledge and use of a language. The question included multiple choices where number 1 signified yes – they believe that the integration of such content would improve their knowledge and language use, 2 signifies no – they do not believe that its integration would improve knowledge and language use, and 3 signifies maybe – it is possible that this factor could improve these aspects in the learning process. 76% of participants believe that the integration of technologies based on gamification would improve students' knowledge and language use. 20% believe that there is potential for its benefits in the context of knowledge development and language use, while 4% do not believe that it would be beneficial. Lastly, participants were asked if they would recommend computer or mobile-assisted language learning. From the research sample 86% stated yes, 2% stated no, and 12% answered maybe.

Table 2.

Major student needs identified by the sample group

What are your major student needs?		
Identified needs	Frequency	Cumulative percent
Entertainment	16	8.6
Fast feedback on progress	28	15
Instructions on how to learn	27	14.4
Flexibility in terms of times and modes of learning	18	9.6
A fixed schedule of lessons	13	7
Creative tasks	20	10.7
Momentary application of lessons	16	8.6
Momentary correction of mistakes	19	10.2
The ability to repeat lessons	20	10.7
Physical stimulation through learning activities	10	5.3

Chart 4.

Representativeness of student needs in the sample

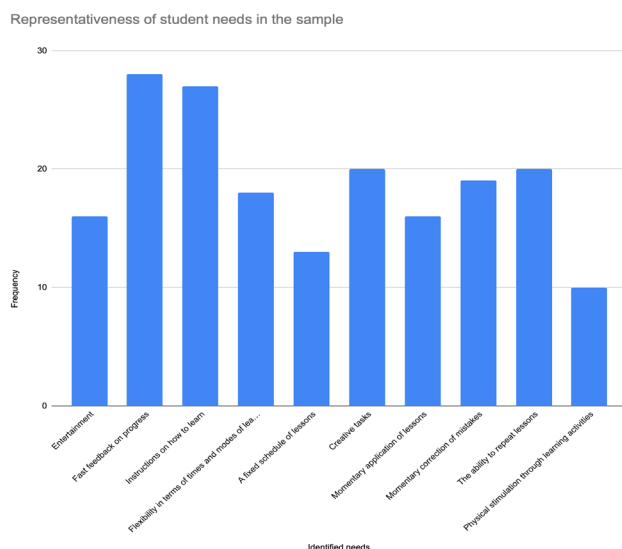


Table 3. Shows the frequency of content form choices per learning style. Participants were allowed to choose several forms of learning that they prefer to employ in their language studies. The most popular choice for the visual type of learners is video games and mobile games, then video and audio formats. For textual learners, as expected,

reading, and translating texts is the most preferred choice, then application of knowledge through speaking and video. Interestingly, auditory learners in the sample preferred the video format most, then verbal communication. Kinesthetic learners seem to have an equal preference for the video format and physical stimulation such as role play.

Table 3.

Content form preferences per learning style (multiple answers were possible per participant)

Content type	Learning style			
	Textual	Auditory	Visual	Kines- thetic
	Frequency of choice			
Voice recordings, music, podcasts	4	3	11	3
Videos, movies, series	6	5	12	5
Role play, physical stimulation	0	1	4	5
Video games, mobile games (narrative, memory, crossword puzzles ...)	1	2	14	3
Reading and translating texts	12	1	5	0
Social media	5	3	6	0
Conversations with native speakers or with those who speak the language with high proficiency	8	4	5	3

According to collected data, the level of correlation between all research variables is very low in the sample except for age and self-rated digital competency, where the Pearson correlation coefficient is 0.3, which indicates a low relationship. A low relationship was also found in the sample between self-rated ability for autonomous use of technology for language learning and attitude towards traditional versus new technology methods of learning and their ability to meet identified student needs (Pearson correlation coefficient: 0.36)

5. Discussion and conclusion

Research data collected suggests a necessity for the application of an eclectic approach in education. The content that is most preferred by the sample group is in video form, such as movies and series. This option was selected by 30 out of 50

individuals which is 60% of participants, hence represents a significant amount for this form of study. Video is a multi-sensorial media that engages several senses at once and provides a fuller experience, closer to real-life, that is more likely to get transferred to long-term memory (Hanson, 2004). Video also provides entertainment to the viewer, which is an important aspect to consider when analyzing the choices made by participants. In today's society, entertainment is everywhere, we even carry it in our pocket, thus the factor of entertainment has become needed in education as well due to the manner in which our minds have become selective and discriminant against unappealing content. Another extremely important element is human attention span which has significantly decreased in the past few years due to the aforementioned entertainment that we as humanity are now used to in the 21st century (Wilmer et al., 2017). Therefore, the ability to learn and acquire new information has not only changed, but has become almost impossible in a traditional environment, which is supported by the previously gathered data. Hence, the indication for application of an eclectic approach in education is clear. By preferring video as a learning medium, participants expressed their need for a dynamic environment and constant entertainment per se, in order to focus and be able to acquire knowledge and new information that they will remember and be able to apply themselves.

The second most preferred content forms are voice recordings, music, podcasts, and practical use of the language with native or highly proficient speakers of the language learned. This somewhat supports previous conclusions where participants dominantly chose video as a learning medium, however an important element in choosing podcasts, recordings and communication with natives of the language shows participants need for immediate application of acquired knowledge. This additionally supports the previously mentioned conclusion that human attention span has significantly decreased, which represents a threat to traditional learning methods and expresses the need for dynamic learning environment and learning methods (Wilmer, et al., 2017). The important aspect for participants obviously is the practice and application of knowledge in real life, which supports many previous studies that have confirmed the well known method of successful language acquisition by traveling or living in countries where the chosen language is spoken (Mancini-Cross et al., 2009).

Very interesting discovery proposed by the gathered results of this research is that reading and translating texts and video games share the third place when it comes to their popularity among learners. Based on previous findings, one could somewhat assume that video games, due to their dynamics and ability to keep participants attention span would come earlier, however it not only comes third in this study's results, but even shares third place with an entirely opposite method of learning, which is reading and translating texts. Therefore, reading and translating texts in the traditional sense and playing games are quite different modes of learning, however, presumably, the link may be that they both require the same type of mental processing in terms of reading and identifying words, making word associations, understanding lexical structures, order, meaning and so on.

Another somewhat surprising discovery is that social media is preferred by 16 out of 50 participants, which makes up only 11.7% of the sample, while role play and physical stimulation were preferred by 11 participants, 8% of the sample. Arguably, the last form of learning is least popular since it requires public performances, and it was not inquired what personality types consist of the participant group, which is an important factor to consider when interpreting these choices and statistics. Considering the fact that participants have previously expressed and chose to practice and learn the language by communicating with a native speaker or highly proficient user of the language would suggest that they would be also open to learning and connecting to natives via social media, as well as role play and physical stimulation as it presents an opportunity for language application in practice and real life. However, participants surprisingly did not go for these methods, therefore, the ratios presented here cannot be generalized to the wide population, but they might provide a basis for further exploration of the topic.

As many previous research studies suggested and confirmed, information and communication technologies (ICTs) can certainly add value to the academic world and learning processes (Pandolfini, 2016). Because of ICTs, students can find knowledge in the real context, whilst instructors have the ability to design curricula according to their preferences. Nowadays, students have advanced skills and abilities in using ICTs, therefore they already know how to adapt to new learning environments which represents a significant advantage in implementation of explored modern practices of language acquisition in education.

6. References

Ahmad, J. (2016). Technology assisted language learning is a silver bullet for enhancing language competence and performance: A case study. *International Journal of Applied Linguistics and English Literature*.

Ally, M. (2009). Mobile learning: Transforming the delivery of education and training. Edmonton; Athabasca University Press.

Anderson, T. (2011). The theory and practice of online learning. Athabasca; AU Press.

Atay, E. & Zabitgil Gülseren, Ö. (2020). The efficiency of mobile assisted language learning (MALL) in vocabulary learning. *Advances in Social Science Research. St. Kliment Ohridski University Press. Ch. 3.* 44–58. Doi: 10.5281/zenodo.4603086.

Baek, Y. K. (2008). What hinders teachers in using computer and video games in the classroom? Exploring factors inhibiting the uptake of computer and video games. *Cyber Psychology and Behavior*, 11(6). 665–671.

Bartolomé, A., & Grané, M. (2004). Education and technologies: from exceptional to everyday. *Classroom for educational innovations*, 12(135), 9–11.

Bećirović, S., Ahmetović, E. & Skopljak, A. (2022). An Examination of Students Online Learning Satisfaction, Interaction, Self-efficacy and Self-regulated Learning. *European Journal of Contemporary Education*. 11(1) 16–35. Doi: 10.13187/ejced.2022.1.16

Bećirović, S., Brdarević Čeljo, A., & Delic, H. (2021). The use of digital technology in foreign language learning. *SN Social Sciences*. 1(10), 1–22. Doi: 10.1007/s43545-021-00254-y

Bećirović, S. & Dervić, M. (2022). Students' perspectives of digital transformation of higher education in Bosnia and Herzegovina. *The Electronic Journal of Information Systems in Developing Countries*. e12243, (1–22) <https://doi.org/10.1002/isd2.12243>.

Cachia, R., & Ferrari, A. (2010). Creativity in schools: A survey of teachers in Europe. Seville. *JRC Scientific and Technical Reports*.

Chen, C. & Jones. K.T. (2007). Blended learning vs. traditional classroom settings: Assessing effectiveness and student perceptions in an MBA accounting course. *Journal of Educators Online*, 1(4).

Chen, P.D, Dumford, A.D., & Guidry, K.R. (2010). Engaging online learners: The impact of web-based learning technology on college student engagement. *Computers & Education*. 54. 1222–1232. Doi: 10.1016/j.compedu.2009.11.008.

Chinnery, G. (2006). Going to the MALL: Mobile assisted language learning. *Language Learning & Technology*, 10(1). 9–16.

Clark. R.E. (2001). A summary of disagreements with the 'mere vehicles' argument. In R.E. (Ed.), *Learning from media: Arguments, analysis, and evidence*. Greenwich, CT: Information Age Publishing.

Clemons, S. A. (2004). Developing on-line courses for visual / kinesthetic learners: A case study. *International Journal of Instructional Technology and Distance Learning*, 1(11).

Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the Coronavirus Pandemic: Students' Perspective. *Sustainability*, 12(24). Doi: 10.3390/su122410367

Dağ, F., & Geçer, A. (2009) Relations between online learning and learning styles. *Procedia – Social and Behavioral Sciences*. 1(1). 862–871, ISSN 1877–0428.

Danilović, M., & Danilović, P. (2013): Informaciono-komunikaciona obrazovna tehnologija – ključni pojmovi (u s`tampi), *Tehnički fakultet "Mihajlo Pupin", Zrenjanin*.

Danilović, M., & Danilović, P. (2012). Problemi određivanja značenja i definisanja pojmova „informaciona“, „informatička“, „informaciono-komunikaciona“, „informaciono-kompjuterska“ obrazovna tehnika i tehnologija. *Technics and informatics in education 4th International Conference*, Technical Faculty Čačak, 1–3rd June 2012.

Deterding, S., Khaled, R., Nacke, L. E., & Dixon, D. (2011). Gamification: Toward a definition. *Gamification Research Network*. Retrieved from <http://gamification-research.org/wp-content/uploads/2011/04/02-Deterding-Khaled-Nacke-Dixon.pdf>

Dunn Egbert, J. (2005). CALL essentials: Principles and practice in CALL classrooms. *Teachers of English to Speakers of Other Languages*.

Farr, F. & Murray, L. (eds.) (2016). Influence of technology on education: 9 Areas – Science – 2022. *The Routledge Handbook of Language Learning and Technology*. Routledge.

Ferrari, A., Punie, Y., & Redecker, C. (2012). Understanding digital competency in the 21st century: An analysis of current frameworks. *Springer Link*.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive– development inquiry, *American psychologist*, 34, 906–911.

Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick, *The nature of intelligence*. Hillsdale, NJ: Lawrence Erlbaum Associates. 231–236.

Flavell, J. H. (1987). Speculations about the nature and development of metacognition. In F. E. Weinert & R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding*. Hillside, NJ: Lawrence Erlbaum Associates. 21–29.

Francisco, M.J. et. al. (2022). Learning during the Pandemic: Factors Contributing to Academic Stress among Special Needs Education Pre-Service Teachers. *Specialusis Ugdymas*. 1.

Garrison, D. & Kanuka, H. (2004). Blended Learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education*. 7. 95–105. Doi: 10.1016/j.iheduc.2004.02.001.

Geddes, S. J. (2004). Mobile learning in the 21st century: benefit for learners. *The Knowledge Tree e-journal*, 6.

Gray, P. (2008, August 20). A brief history of education. *Psychology Today*. Retrieved 2022, from <https://www.psychologytoday.com/us/blog/freedom-learn/200808/brief-history-education>

Hanson, R. (2004). Mass communication: Living in a media world. SAGE Publications, Inc; Sixth edition.

Hasifa, N., Rizal, R., & Lapasere, S. (2020). The role of learning management in the pandemic time covid-19 towards the learning achievement of class II students of SDN inpres 2 tanamodindi. *Jurnal Dikdas*. Retrieved from <http://jurnal.untad.ac.id/jurnal/index.php/ESE/article/view/17052/pdf>

Hastings, S. & Jenkins, S. (2005) Learning styles. *The Times Educational Supplement*..

Hodgkinson, G. P., & Sadler-Smith, E. (2003). Complex or unitary? A critique and empirical re-assessment of the Allinson-Hayes Cognitive Style Index. *Journal of Occupational and Organizational Psychology*, 76(2), 243–268. Doi: 10.1348/096317903765913722

Huotari, K., & Hamari, J. (2012). Defining gamification: A service marketing perspective. In Proceeding of the 16th International Academic MindTrek Conference. New York, NY: ACM. 17–22.

Kenney, J., & Newcombe, E. (2011). Adopting a blended learning approach: Challenges encountered and lessons learned in an action research study. *Journal of Asynchronous Learning Networks*, 15(1).

Kilickaya, F. & Krajka, J. (2010). Comparative usefulness of online and traditional vocabulary learning. *Turkish Online Journal of Educational Technology*. 9. 55–63.

Kintu, M.J., Zhu, C. & Kagambe, E. (2017) Blended learning effectiveness: the relationship between student characteristics, design features and outcomes. *Int J Educ Technol High Educ*. 14. 7. Doi: 10.1186/s41239-017-0043-4

Kozma, R. B. (2001). Counterpoint theory of 'learning with media'. In R.E. Clark, Learning from media: Arguments, analysis, and evidence. Greenwich, CT: Information Age Publishing Inc.

Learning styles and the online environment – ion professional eLearning programs. *UIS*. (2018). Retrieved from <https://www.uis.edu/ion/resources/tutorials/instructional-design/learning-styles-and-the-online-environment/>

Livingston, J. A. (1997). Metacognition: An overview. Retrieved December 27, 2011 from <http://gse.buffalo.edu/fas/shuell/CEP564/Metacog.htm>

Luaran, J. E., Samsuri, N. N., Nadzri, F. A., & Mohamad Rom, K. B. (2014). A study on the student's perspective on the effectiveness of using e-learning. *Procedia – Social and Behavioral Sciences*, 139–144.

- Lucas, B. (2005) What are the learning styles of an effective lifelong learner? Should we do more to profile these?. *Keynote Address European Learning Styles Information Network – 10th International Conference, School of Management, University of Surrey, 13th– 15th June 2005.*
- Lucas, R. W. (2004). The creative training idea book: Inspired tips and techniques for engaging and effective learning. *New York: AMACOM.*
- Mancini-Cross, C., Backman, K.F. & Baldwin E.D., (2009). The effect of the language barrier on intercultural communication: A case study of educational travel in Italy, *Journal of teaching in travel & tourism*, 9:1-2, 104-123, Doi: 10.1080/15313220903042004
- Meichenbaum, D. (1985). Teaching thinking: A cognitive-behavioral perspective. In S. F., Chipman, J. W. Segal, and R. Glaser (Eds.), *Thinking and learning skills, Vol 2: Research and open questions.* Hillsdale, NJ: Lawrence Erlbaum Associates.
- Mohd Basar, Z., Mansor, A. N., Jamaludin, K. A., & Alias, B. S. (2021). The effectiveness and challenges of online learning for secondary school students – A case study. *Asian Journal of University Education, Vol 17*(3), 119. Doi: 10.24191/ajue.v17i3.14514
- Murnani, Z. T., & Salehi, H. (2015). Effect of electronic dictionary as an ICT tool on English collocation learning of EFL Learner. *Asian Journal of Education and e-Learning*, 3(5).
- Navarro, P. & Shoemaker, J. (2000). Performance and perceptions of distance learners in cyberspace. *American Journal of Distance Education*. 14. 15–35. Doi:10.1080/08923640009527052.
- Nguyen, T. (2015). The effectiveness of online learning: Beyond no significant difference and future horizons. *MERLOT Journal of Online Learning and Teaching*, 11(2).
- Olofsson, A. D., Lindberg, J., Fransson, G., & Hauge, T. E.. (2015). Uptake and use of digital technologies in primary and secondary schools – a Thematic Review of Research. *Nordic Journal of Digital Literacy*. 10. 103-121. 10.18261/ISSN1891-943X-2015-Jubileumsnummer-08.
- Pandolfini, V. (2016) Exploring the impact of ICTs in education: Controversies and challenges. *Italian Journal of Education*. 8(2). 28–53.
- Ring, G. & Mathieux, G. (2002, February). The key components of quality learning. Paper presented at the *ASTD Techknowledge 2002 Conference, Las Vegas.*
- Rosset, A. (2002). Walking in the night and thinking about e-learning. In A. Rosset, *The ASTD e-learning handbook*. New York: McGraw-Hill.
- Rovai, A. & Jordan, H.M.. (2004). Blended learning and sense of community: A comparative analysis with traditional and fully online graduate courses. *International Review of Research in Open and Distance Learning*. 5. Doi: 10.19173/irrodl.v5i2.192.
- Sangrà, A. & Gonzalez-Sanmamed, M. (2010). The role of information and communication technologies in improving teaching and learning processes in primary and secondary schools. *ALT-J*. 18. 207–220. Doi: 10.1080/09687769.2010.529108.
- Sprenger, M. B. (2002). *Becoming a “wiz” at brain-based teaching*. California: Corwin Press Inc.
- Wilmer, H. H., Sherman, L. E., & Chein, J. M. (2017). Smartphones and cognition: A review of research exploring the links between mobile technology habits and cognitive functioning. *Frontiers in psychology*. 8. 605. Doi: 10.3389/2017.00605